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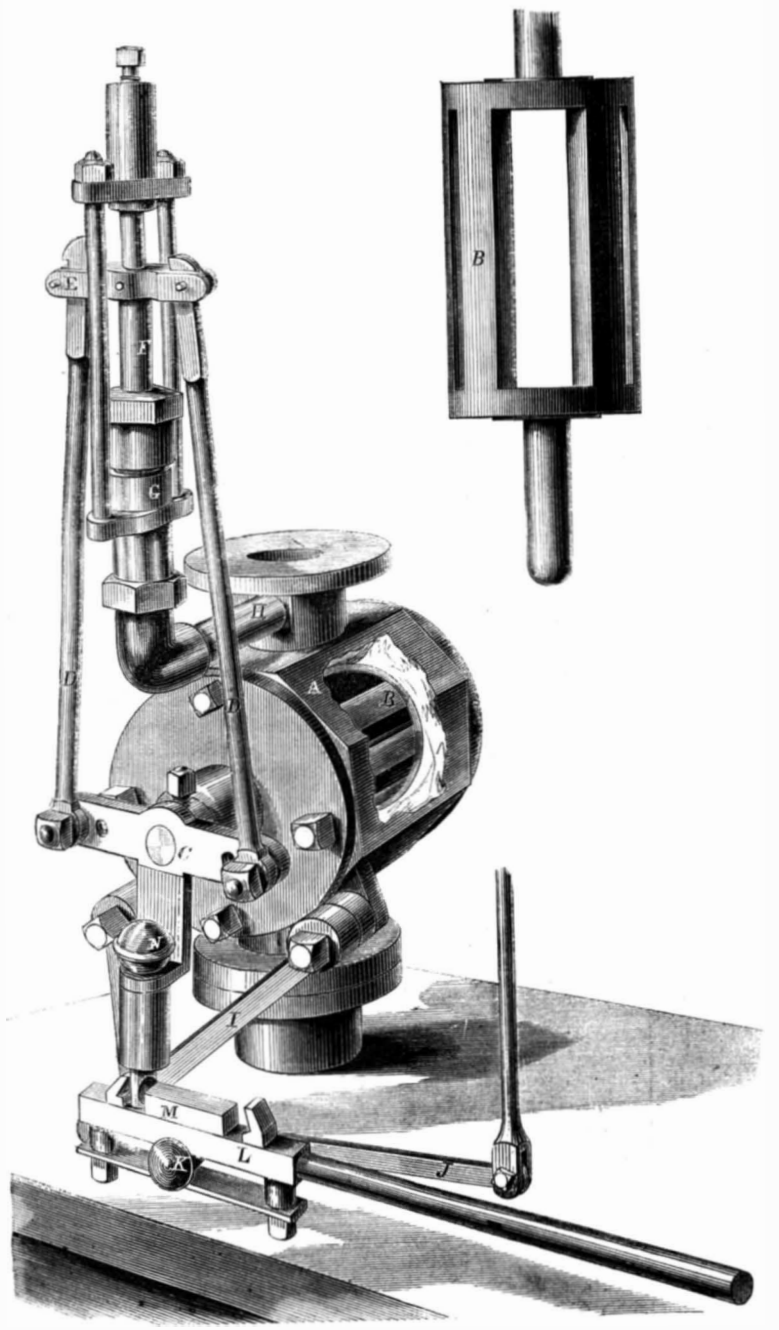
Improved Automatic Cut-off and Governor Valve.

The governor of a steam engine fulfills the same office as the brains in a man's head: it directs and regulates every movement of the machine; controls the engine when it gets unruly and goes too fast; and stimulates, when it lags or does not come up to its duty. The essential features in apparatus of this class are, that it shall be sensitive, easily worked, admit steam freely with a slight movement of the valve, be in all respects easily kept clean, sightly, and not liable to derangement, from bad oil the filling up important parts, or sticking them, so that they hang and will not run or perform as they were intended to. A properly-made governor valve and cut-off, is a source of economy to an engine, which should not be omitted; for if only light duty is required of the engine, the governor admits the requisite steam to do that duty and no more; and where the reverse is true, the apparatus always regulates the openings, to supply the demand whatever it be. For this reason every pound of coal will do its full duty, so far as regards steam introduced into the pipes and chest. The cut-off above illustrated, is combined with an automatic or self-regulating apparatus, for opening and closing the valve, and we have the assurance of the inventor that it does its work thoroughly: in every instance where it has been attached to engines, the proprietors have been pleased with its operation and economical results.



STEWART'S AUTOMATIC CUT-OFF AND GOVERNOR VALVE.

The following is a description of the several parts. The cast-iron chamber, A, is bored out straight, and has the rotating valve, B (see Fig. 2), fitted in it. There is a shell inside of the chamber, around which the steam follows, until it finds entrance to the valve, through a single port cut in the shell. The valve is hollow, and has two ports on each side—four in all: as may be seen. As the steam rushes in, it enters through the port that may be opposite the opening in the shell, until it reaches the main slide valve of the engine, where it is admitted to the cylinder, as in all other engines. The method of operating this valve is by the usual eccentric rod and the fixtures outside of the valve chamber. To the valve rod there is fastened a three-armed lever, C, which has two rods, D, proceeding from its opposite ends to a cross-head, E, attached to a plunger, F. This plunger works in a chamber, G, which is open to the steam pipe by the connection, H. The hanger, I, is bolted to the valve chamber, and, at its lowest extremity, has a joint which carries the end of the lever, J; a short distance from the joint, the pin, K, is fastened, on which the tripping rod, L, slides; on his rod there is a steel block, M, which engages with the end of the pin, N, sliding in the lower end of the three-armed lever. These are the principal details. The operation is as follows:—When the engine is started, the block engages with the pin, N, and turns the valve in its chamber, through the agency of the arms, C; the rod on one of these arms pulls down the cross-head, E, while the opposite rod slides up through the same; as the tripping rod passes on, the catch is disengaged, and the valve flies back in its place by the elastic force of the steam under the plunger, F, working in the chamber, G; the same operation is repeated on the return stroke, and the valve is alternately tripped by the catches on the rod, and restored to its exact position by the action of the steam on the bottom of the plunger. The end of the lever, J, has an arm which connects to the ordinary governor, so that, as the lever is raised or lowered, the hold of the catch block on the pin will be increased or reduced, as the case may be. In the engraving the apparatus is attached to a steam chest bonnet, while the upper end which connects to the boiler is open to view. One of these cut-offs may be seen at Brunjes, Ockershausen & Co's., Sugar Refinery, in this city, or at E. S. Esty's Tannery, Ithaca, N. Y. The engineer at this place says he effects a saving of 15 per cent in fuel, and that the engine performs much better than it formerly did without this attachment; another is now in course of erection at the Trenton Armory, Trenton, N. J. Three patents have been granted on this invention, to Robert Stewart, of Elmira, N. Y., two of which bear date respectively May 19, 1863, and one June 30, 1863; further information may be had by addressing R. Stewart & Co., Elmira, N. Y.

A New Flying Machine.

Mr. Solomon Andrews, of Perth Amboy, well known as an ingenious mechanician, has been experimenting for some time with a flying machine of his invention, and has, according to the *Herald*, achieved a remarkable success. The machine will carry three persons in addition to the operator, and is in shape similar to three cigars joined laterally; these cigars are capable of containing 26,000 cubic feet of hydrogen, and sustain a dead weight of 432 pounds, exclusive of fixtures, paraphernalia, &c. The car attached is 12 feet long, 16 inches wide, and is supported by 120 cords, 16 feet below the balloons or gas cylinders, which are made of varnished linen. The *Herald* reporter says:—

"On Friday, the 4th instant, Dr. Andrews made his last experiment, and demonstrated to an admiring crowd the possibility of going against the wind, and of guiding her in any and every direction with a small rudder having only seventeen square feet of surface. He made no long flight in one straight line, lest his *modus operandi* should be divulged; but, by a most ingenious plan, demonstrated her capabilities beyond all possibility of doubt, whilst he prevented a public knowledge of his method of propelling.

"After a few short flights, to satisfy himself and a few friends that all was right, and that she would do all he had contemplated, he set her off in a spiral course, upward, she going at a rate of not less than one hundred and twenty miles per hour, and describing circles in the air of more than one and a half miles in circumference. She made twenty revolutions before she entered the upper strata of clouds, and was lost to view. She passed through the first strata of dense white clouds, about two miles high, scattering them, as she entered, in all directions. In her upward flight could be distinctly seen her rapid movement in a contrary direction to the moving clouds, and as she came before the wind, passing by them with great celerity. As she was distinctly seen

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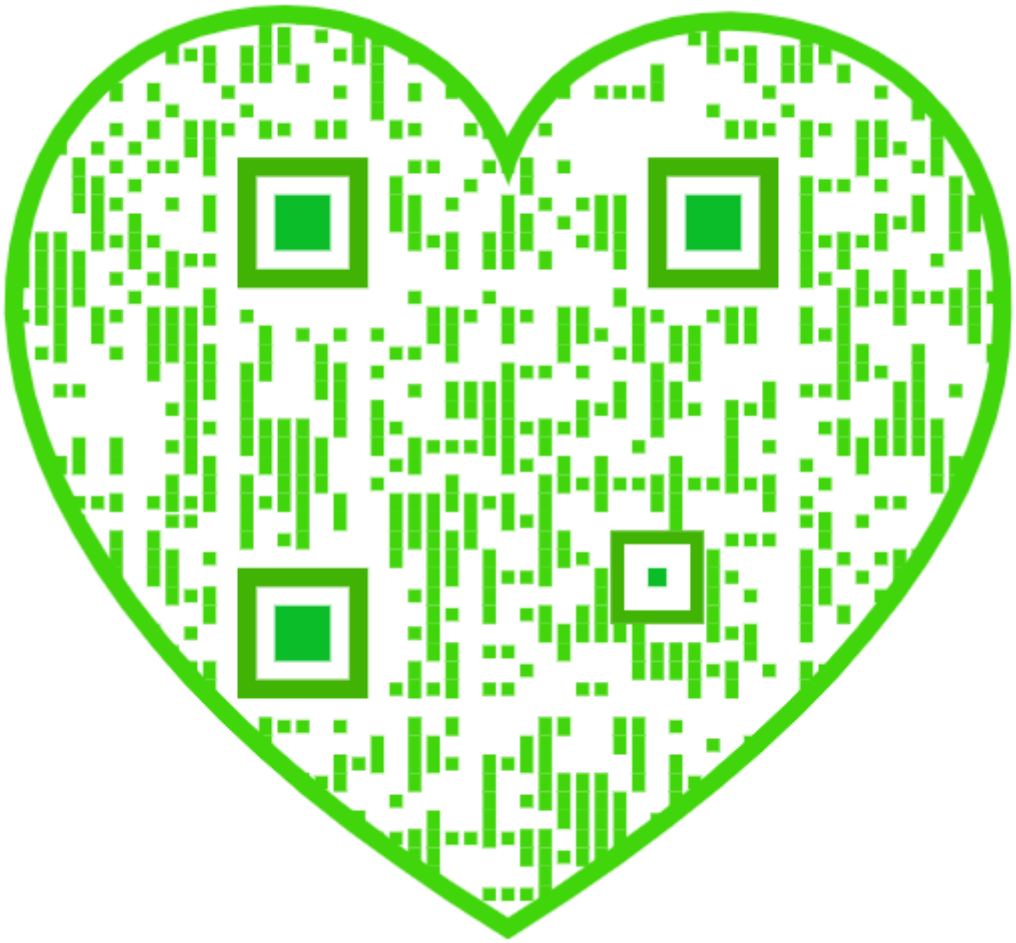

thus to move, both below and above the clouds, on the clear blue sky at five o'clock P. M., with the sun shining clear upon her, there could be no mistake or optical delusion to the beholder. As to her propelling power and motive apparatus, it behooves us not now to speak. It might be considered contraband of war, or affording aid and comfort to the enemy; for with such a machine in the hands of Jeff. Davis, the armies around Washington would be powerless to preserve the capital."

The reporter doesn't mention that Dr. Andrews descended, but we infer that he "still lives."

IMPERTINENCE OF THE ORDNANCE DEPARTMENT TOWARD INVENTORS.

If all the dissatisfaction, mortification, and unnecessary annoyance, to which inventors of weapons and munitions of war have been subjected at Washington, could be heard by their tormentors, they would certainly take some steps to change their demeanor. Incessantly we hear complaints from men who have gone to Washington, with guns, shot, and shell, constructed on sound principles, proven to be good, and been snubbed outrageously, or else thwarted in their efforts to obtain a hearing and a trial of their respective inventions. Not long ago, an inventor called at this office and exhibited drawings of a new and improved plan for attaching armor to vessels—the same having been put to practical tests, in the gunboat *Essex*, and withstood the severest usage—and informed us that the subject had been before the Secretary of the Navy for eighteen months, but that no decision was arrived at in the matter. Some time after, the inventor learned incidentally that the India-rubber backing—one of the features of his plan—had been experimented upon at the Washington Navy Yard, and declared useless! This conclusion was arrived at from these premises:—an experimental target was made, in which the rubber was laid on the *face* of the iron; the rubber was pierced, of course, at the first fire. Deduction—India-rubber is useless with iron plates—conclusion of the experiment, the rout and confusion of the inventor! Our information upon this case is a sample of what has been done in the same line of business for other inventors. Men have been pooh-poohed away and dismissed unceremoniously, by individuals who seem to think that, in taking a position to serve the people, they have, by some extraordinary transmigration, been suddenly lifted above the level of the "ignoble inventors" they treat so cavalierly. One persistent and worthy inventor, whom we have known for a long time, obtained a private audience with the Chief Magistrate, in reference to a long-range gun of peculiar construction that he has been experimenting on for years. Mr. Lincoln gave orders to the Ordnance Department that experiments on the weapon should proceed with dispatch; and on this being announced to some functionary concerned in the execution of the order, he exclaimed, "What does Lincoln know about a gun? We're bothered to death with these inventors running here all the time."

These impositions on suffering officials should cease at once. That a man should be requested to do the duty for which he is paid, seems almost too great an outrage for belief! All inventors may not have Lord Chesterfield's cultivation or courtesy, but that is no argument against the utility of their inventions, or any reason for manifesting impertinence or snobbishness toward them. Happily, in this country, brains are more honored than position; and if a man is unfit for his place, bluster and bravado cannot conceal it.

We are pleased to find that inventors, generally, except Mr. H. A. Wise, the head of the Ordnance Department, from any neglect, intentional or otherwise; all parties unite in according this gentleman a willingness and favorable disposition toward new inventions which it would be well for others to adopt. If the matter rested here, and was only a question of a want of courtesy, or indeed common civility, the Ordnance Department would still be censurable; but as it has a far greater importance than this, we have felt it our duty to exclaim earnestly against a further continuance of the acts complained of. It affects the development of inventive talent to a very serious degree; and if our war-ridden country ever required the services of this class of men, she certainly does now. Possibly the Ordnance Department can supply all the plans necessary for the defense of our ports, but until we see stronger evidence of its ability to do so than has been hitherto manifested, we shall continue to urge that all men be heard. We have before us at this writing the letter of one of our clients, which runs as follows:—

"MESSRS EDITORS:—Through reading an article in the SCIENTIFIC AMERICAN, about eighteen months ago, on "Submarine Gunnery," I was led to bestow some thought on the subject, resulting in a series of experiments, which demonstrated, in a manner satisfactory to myself and all acquainted with my investigations, that, by the use of water-proof canisters similar in principle to the percussion, cartridge guns might be fired, with facility, safety, and effect, when surrounded by and filled with water. This proven, I crowded my plans as rapidly as possible, and on Aug. 25, 1862, sent a memorial to Washington, describing my experiments and their results, and requesting to be allowed to prove to the naval authorities the correctness of my theory: but as yet I have been unable to obtain an answer."

This case is but one of many that have come to our personal knowledge; but we have heard of countless others, all making the same complaint—of rudeness and circumlocution of the rankest kind. Things have reached such a pass that inventors are shy of presenting plans that have to be experimented upon by Government before acceptance, and the consequence is that the country suffers. Common sense will acknowledge that every man who presents himself at the Washington Navy Yard is not a paragon of science and inventive talent; but that does not invalidate his claim to be heard, and his invention honestly and fairly tried. If it be worthless, it is so much sooner disposed of. If the task of overlooking all the new weapons that are brought in is too much for the Department, let those concerned make proper representation to Government; but they have no excuse for treating inventors insolently, or demeaning themselves in a way that reflects no credit upon themselves or the country which they serve.

Since the above article was written, Gen. Ripley, Chief of the Ordnance Department, has been removed.

The Sewing Machine—What it has done for Scottish Operatives.

The following extracts upon a most interesting topic are taken from the *North Briton*, published in Edinburgh:—

"Within the last ten years great are the changes that have taken place in the trades of boot-closing and boot and shoe making, not only in Edinburgh, but all over the country. Great also are the pecuniary, physical, and social benefits that these changes have secured for the workers. Ten years ago there was no such thing in this city as a workshop for either boot-closers or boot and shoe makers. In the homes of these men the hammer sounded night and day. In numberless cases a single apartment served for dining-room, bed-room, and workshop. Now workshops are to be seen wherever boots and shoes are made. Ten years ago, the custom of the trade was for the operatives to take their work from the shops of their employers to their own homes, there to make it up; and when we say that about twelve hundred hands are employed in Edinburgh in the manufacture of boots and shoes, it will at once be seen what wide spread discomfort must have hitherto prevailed by the homes of these people being used as workshops. But within the last ten years there has been a sweeping change. Wives and children who were formerly the victims of such an irrational system, have now homes like the homes of other working men's families—that is, homes freed from the curse of being also the workshops of masters. This great change in the physical and social condition of those who are employed in the boot and shoe trade has not been the result of a strike or strikes: it has been brought about by the introduction of those simple but active little sewing machines used for the closing of boots, and for which we are indebted to our cousins across the Atlantic.

"When these machines were introduced into Edinburgh for the closing and binding of boots, a cry was raised by some of the boot closers that their families would be starved, that the sewing machines would ruin the trade and throw them all idle. Others in the trade affected to laugh at these childish fears; they took a different though not less hostile view of the matter, and prophesied the speedy downfall of the machines. Those men argued that, although the sewing machine might do well enough for some purposes, such as the making of ladies' stays, no kind of labor but hand labor would do for leather. All the operatives in the boot and shoe trade looked on them with a jaundiced eye; every man's hand was against them; yet in spite of all this opposition they are now to be heard birring away everywhere, and the change they have effected in the boot and shoe trade alone is almost miraculous.

"That machine labor, when it can be employed either on a large or small scale, is incomparably superior in every respect to hand labor is clear, otherwise it could not fight against and ultimately overcome the fierce and determined enemies it has had to encounter wherever it has appeared. In machine labor we see the doctrine of the New Testament daily practised, which has been taught to saint and sinner with but little success for the last eighteen hundred years. That machinery loves it enemies and does good to them that hate it we shall presently show, by taking a brief glance at the past and present condition of the operatives connected with the boot and shoe trade, a trade in which those little sewing machines have worked a complete revolution. Without fear of reasonable contradiction we affirm that, within the last ten years, the operative shoemakers of Edinburgh have been physically, socially, and morally improved beyond any other trade that could be named. Ten years ago the trade was proverbial for what appeared to be its hopeless poverty. So much was this known that landlords cared not to let houses to journeymen shoemakers. Ten years ago, husband, wife, and children sat in the humble home, working together by night or by day, as the work could be got; not to live, but to die premature deaths: for the irregularity of the system in which the work was then given out to the workers made it a system of disease—a chain of suffering by which every link in the family was less or more affected. Ten years ago, when the general practice in the trade was for the operatives to work in their own homes, wages were a great deal less than now; so much less that the husband can now earn as much with his own hands in the workshop of his employer, and also enjoy his half-holiday like other tradesmen, as he could do at home under the old system with the assistance of his wife and children. Like all other improvements in the production of labor, the sewing machine has increased the boot and shoe making trade in numbers, and lifted the men up to a position they never could have attained without it. Employers who ten years ago got up their work by the pair now get it up by the dozen of pairs. There is now no possibility of a drunken boot-closer being the cause of a sober boot-maker having to walk about the streets idle. There is now no possibility of the family of the ladies' boot maker suffering privations, until the sickly mother regains her lost strength to bind the boots the father makes. The little sewing machine keeps all parties going briskly on. So rapid and untiring are its movements that it cheerily hands over to the men who condemned it a part of the money it makes so easily, thus raising their wages for them, a thing they could not do for themselves: and proving what we said at the outset, that machinery loves its enemies, and does good to those that hate it."

THE CHARLESTON BIG GUN.—A correspondent of the *Herald* says the 300-pound Parrott, which Gillmore was using to shell Charleston, was not disabled by the accident which occurred to it. The injury was received from the untimely bursting of a shell, just as it was passing out of the muzzle of the gun. This accident blew off the muzzle band, but the remainder of the piece is uninjured, and in as good condition as ever for practical work. Within twenty-four hours after the fact was known at Washington, another gun of the same kind was on its way to Charleston.

A MINER at Pike's Peak writes that the miners are very much discouraged. They have to dig through a solid vein of silver four feet thick before they can reach the gold.

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Making Small Fire Balloons.

The material for making a small balloon should be a fine, thin, close textured tissue-paper. Having determined that the balloon shall consist of a specific number of gores, or sections, say 32 or 16, a pattern for cutting them by should be made of paste-board, or some tolerably hard substance. Suppose the entire hight of the balloon, without its appendages, is to be three feet, and the number of gores thirty two, an elegant shape will be got by making the pattern an inch wide at one end, three inches at the other, and eight inches at its broadest part, which should be at one third of its length, if the balloon is intended to have a pear-like figure. Varnish the gores with the ordinary boiled oil, and hang them up singly on lines till perfectly dry. They are next to be put together, which may be done with gum-water, or clean thin paste. After pasting or gumming about half an inch of one of the gores, lay the edge of another about midway across the part pasted, and then double over about a quarter of an inch of it, dabbing it lightly from end to end with a clean cloth, to insure its holding securely. Two of the gores being thus united, unite two others in like manner, and so on, until, if you have had thirty-two gores in all, you reduce your number to sixteen. In like manner proceed till you make your number eight, then four, and then two; hanging the sections up at every pasting, so that they may get thoroughly dry as you proceed. The two halves are last of all to be connected in the same way; and this part of the undertaking is then completed. A circle of wire about six inches in diameter should be worked into the bottom of it, to keep the fabric of the balloon at a sufficient distance from the flame of the spirit. Another wire may be fixed across this circle to hold a piece of sponge, which should be immersed in spirits of wine. A smoldering piece of brown paper held underneath the aperture will, in a few minutes, put the balloon in an asceading condition. Having thus inflated the balloon, ignite the piece of sponge, and let it rise. When it is intended to inflate the balloon with hydrogen or coal gas, the latter apparatus is not needed; but a light car, or any other ornament proportioned to the ascending power of the balloon, may be appended to it, which will have the effect of maintaining it in the right position, and also of keeping it longer in sight than would otherwise be the case.

MISCELLANEOUS SUMMARY.

Anti-Corrosive Coating for Iron Ships.—The London *Engineer* states that a vitreous plating has been applied to the *Ellora* (a screw iron steamer belonging to the Peninsular and Oriental Company), and the vessel has made two voyages, during which the coating has remained perfectly clean. This vitreous coating is made in plates and attached to the ship's bottom by a very adhesive composition. It has been applied to the iron-clad frigates *Warrior*, *Resistance* and *Hector*. The cost is about thirty-six cents per square foot.

A new speculation has recently been entered into by a house in London, viz: importing sea-weed of a particular character for bed stuffing. The material, when dried in the sun, is lighter than any other vegetable of a marine description. It is superabundant in the Bay of Islands, and is used by the natives for bedding. Elasticity is one of its chief properties. The name given to this species of the *fuci* family, by the New Zealanders, is *mummuk*. The same article has been used in this country for years.

London papers continue to ascribe complete success to the Pneumatic Post. It is constantly employed in carrying the mail bags from the post office to one of the railway stations. Thirty trains have been run daily with it, and to test its capacity fully, one hundred and seventy-two trains, each carrying 1½ tuns, were carried in one day. A new pneumatic tube, 54 inches in diameter and 2½ milesi n length, is about to be laid down in London.

Tribute to an Inventor.—A monument to the memory of the late Samuel Colt, the inventor of the revolver, is to be erected at Hartford, Conn., of Scotch granite. Mr. J. G. Butterson, of that city, the designer of the Worth monument, in this city, has gone to Scotland to select and purchase the granite. The monument is to cost $25,000.

Remedy for Burns with Hydrofluoric Acid.—This acid, which is much employed for etching on glass, is dangerous to inhale as a vapor, and when it touches the hands it produces severe sores, similar to those of burns. As a remedy for such burns M Ressler, in the *Repertoire de Chimie Appliquee*, recommends the application of lint wetted with acetate of ammonia, and the injection of the same solution into the blisters, if any have formed. If, however, the acid has got into places difficult to moisten—under the nails, for instance—he recommends caustic ammonia to be used instead of the acetate, and remarks that the patient should not trouble himself about the pain, sometimes very acute but transient, which follows the application.

Wages at the Charlestown (Mass) Navy Yard.—The pay of mechanics in the Charlestown Navy Yard has been increased by order of the Secretary of the Navy, as follows, taking effect upon the 1st of August. The first class of ship carpenters who have been receiving $2 50 per day to have $3; the second class from $2 26 to $2 76; third class from $2 to $2 26; the first class of joiners increase from $2 26 to $2 76; the second class from $2 to $2 50, and the third class from $1 76 to $2 26; in the machinist's department, an increase from $2 50 to $2 76 per day. The whole number of men now employed in the yard is 3,300, to be increased shortly for the building of three large ships.

Raising a Steamer by Balloons.—M. Bauer, an engineer, has raised a steamer which sank two years ago in the Lake of Constance. The engineer, in order to raise the vessel, which was lying at the depth of seventy feet, made use of an apparatus of his own invention. By means of divers, he attached to her, one on each side, two large balloons made of water proof linen, which he filled with air. When the expansion had become sufficient, a movement was observed in the water, which looked as if boiling, and the vessel came to the surface. Virtually the same thing has been done in this country, with water-tight casks and India-rubber camels.

Improvement in Macadamized Roads.—A French engineer has made an improvement in making Macadamized roads that promises good results. The main feature of the invention is a steam roller, to consolidate gravel and broken stone. A pair of cylinders, inclined at forty-nine degrees, act on an outside crank on one end of the axle of the main roller or drum. The front axle has broad wheels, and is controlled by steering gear similar to that used on steam carriages and traction engines. This machine can run both backward and forward with equal facility; is easily reversed, and can work on a short piece of road until sufficiently consolidated.

Comprehensive Board of Trustees.—The Polytechnic College of Pennsylvania, in Philadelphia, chances to have, as members of the Board of Trustees, three out of the four candidates on the State ticket, viz: Hon. George W. Woodward, the Democratic nominee for Governor; Hon. Daniel Agnew, the Union nominee for Judge of the Supreme Court, and Governor Curtin, who is a candidate for re-election. It is expected that all three members of this "happy family" will speak, at the Commencement of the College on the 15th proximo.

The interests of humanity and agriculture are much injured by the mill-dam ten miles below Concord, Mass., which sets back the water twenty-five miles, and does more damage every year than would furnish all the mills with steam engines, engineers and fuel. This waste of rich land is a living disgrace to the State of Massachusetts, and shows its legislation a century behind the age, so far as relates to the interests of agriculture.

By fusing together a mixture of clean sand, sodium, common salt and fluor spar, with copper, so as to combine about five per cent of silicium with the copper, a beautiful alloy is produced, according to experiments said to have been lately made in France, by M. M. Deville and Caron.

There is a weed called the *Sida retusa*, which grows wild in unfrequented streets and vacant places at Brisbane, Eastern Australia, and is looked upon there as a pest. This weed has been found to yield a valuable fiber, and £30 a tun has been offered for 3000 tuns of it, for shipment to England.

Vermont Wool-Growing.—The beneficial effects of encouragement is exhibited by the present condition of the wool-growing interest in Vermont, which has sent the best sheep to the International Agricultural Exhibition. In 1787 the General Assembly of Vermont, by suitable enactments, encouraged the growth of wool, and the returns of each successive census show a gradual increase, until in 1860 the annual product was 2,975,544 pounds. For many years it might well have been said of Vermont—"all the women that were wise hearted did spin with their hands," and during the non-intercourse with Great Britain, the General Assembly passed a joint resolution, saying that it would be considered ungentlemanly for a member of the House or the Council to appear in his seat, otherwise than clad in the growth, production, and manufacture of the State."

The Story of two Bullets.—The Vicksburg correspondent of the Missouri *Republican*, narrates the following singular incident:—"At the head-quarters of Colonel Slack's brigade I lately saw two Minie bullets, one of which was a rebel bullet of English manufacture, smuggled over by our dear brethren in Britain to shoot their dear brethren in America. The other was a national ball, of the Springfield rifle type. The former was fired from a rifle pit at Jackson, at our skirmishers. The latter was fired from our line of skirmishers at the rifle pit. They met midway in the air, were welded by the compact, and fell harmlessly to the ground. They are now firm friends, sticking each to the other, closer than a brother or a lover."

Among the exotics recently introduced into France is a new tuber, brought from Peru by M. Cochet, who has resided twenty years in South America. This new plant has been cultivated for two years in the Jardin d'Acclimatation of the Bois de Boulogne, and has passed two winters without requiring more attention than the potato. Besides its nutritive and medical properties, it is very rich in sugar, of a quality superior to that of beet-root. The yield of this plant per hectare will average 150,000 kilogs: (60 tuns) per English acre. In honor of its introducer this valuable root is called the *pomme de terre Cochet*.

Americans in South America.—Mr. Wm. Wheelwright, of Newburyport, Mass., whose enterprise has so successfully developed the railroad capabilities of Chili, is at present urging forward the scheme of a railroad from Rosario, in the Argentine provinces of South America, to Cordova, to connect the Atlantic with the Pacific. From the authorities of that country he has obtained liberal grants of lands, etc., and his English friends have issued proposals in London for subscriptions to the project, by a company with a capital of eight milion dollars. The traffic of such a road would, it is stated, be very great.

The famous Marsh Angel battery, whence Charleston was bombarded, is in the midst of a marsh, 2,600 yards in advance of Morris Island. It was located at night, by the men making their way to it on their stomachs. Planks three inches thick were driven down as the sub-stratum; on this was laid several layers; on these logs, and on them boards. In the meantime the ordnance was floated up by night, and sand bags innumerable, from every direction; one night a large force piled them up, and, to the surprise of the rebels, a dangerous battery greeted their eyes next morning.

To Clean Canary Birds.—These pretty things are like meaner objects, often covered with lice, and may be effectually relieved of them by placing a clean white cloth over their cage at night. In the morning it will be covered with small red spots, so small as hardly to be seen, except by the aid of a glass; these are the lice, a source of great annoyance to the birds.

A visitor to the Treasury Building, Washington, who has been inspecting the machinery for getting out the notes of the currency, says:—"Art and science have not yet been exhausted, and further developments may be looked for. When our national currency is completed, it will surpass in splendor and perfection all other paper currency in the world."

It is rumored that the United States gunboat *Vanderbilt* has been sunk in an action with the Confederate pirate *Georgia*. We cannot credit this statement until better evidence is obtained.

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MANGANESE.

This substance, although not used in the arts in a metallic condition, is in many respects valuable to all who are engaged in the pursuit of science, owing to the peculiar affinity it has for oxygen. The most common source of manganese is the black oxide, known also as the binoxide, or peroxide, MnO_2. In the form in which it is usually met in commerce, peroxide of manganese is an intensely black, heavy powder, prepared by grinding up the native variety. The chief uses of peroxide of manganese are for the preparation of oxygen and chlorine. When it is heated to dull redness, a portion of the contained oxygen is evolved, and sesquioxide of manganese is left behind. If the manganese has been free from chlorides, the oxygen will be pretty pure, but otherwise the first portions of gas which come over are liable to be contaminated with chlorine.

Binoxide of manganese is of constant use in the laboratory for the preparation of chlorine; for this purpose it is acted on by hydrochloric acid, either by the direct addition of this acid to it, or by making a mixture of common salt and binoxide of manganese, and then heating this with oil of vitriol. The chlorine is liable to be contaminated with free hydrochloric acid, and should, therefore, be washed in water, which will hold back the free acid. If required dry, it should then be passed through oil of vitroil. When peroxide of manganese is ignited with caustic potash or soda, in contact with air, or when fused with an alkaline chlorate or nitrate, more oxygen is absorbed by the manganese forming manganic acid, $Mn\ O_3$, which unites with the alkali present, forming a manganate. Manganate of potash forms an intense bluish green solution, which is permanent when an excess of alkali is present. When an acid is added, or when the manganate of potash is allowed to remain in contact with the atmosphere containing carbonic acid, the manganic acid set at liberty is split up into peroxide of manganese and into another acid, permanganic acid, $Mn\ O_3$, which instantly unites with some of the alkali, forming a permanganate of an intense purple-red color.

Permanganic acid in aqueous solution, may be obtained by adding to permanganate of baryta the exact quantity of sulphuric acid necessary to precipitate all the baryta, and then filtering through asbestos or gun-cotton. Sulphate of baryta remains on the filter, and the filtrate consists of permanganic in aqueous solution. It forms a beautifully-colored liquid, which appears dark carmine red by reflected, and dark violet by transmitted, light. When somewhat dilute it is reddish blue, and a still larger addition of water gives it a carmine color. The acid imparts a distinct red color to very large quantities of water. It is inodorous, and has at first a sweet, and afterwards a bitter, rough taste. It stains the skin, but does not redden litmus, as, owing to its powerful oxidizing properties, it destroys the coloring matter of the paper, at the same time turning it brown, from deposition of hydrated peroxide of manganese.

So far as we know, manganese is not used in the arts in a pure state, but as an oxide. Its value depends upon the oxygen which it contains, and the facility with which it parts with this useful gas. Vast beds of it have been opened up at Brandon, Chittenden and Irasburg, in Vt., and it is found in several other localities in the United States. In the manufacture of the chloride of lime which is used so extensively for bleaching linen and paper, 1 part of the binoxide of manganese, 1¼ parts of common salt, 2 parts of concentrated sulphuric acid, and 2 parts of water, are mixed together in a retort, to which heat is applied. By the reaction which takes place in the retort, the salt, which is a chloride of sodium, gives off its chlorine, and the gas is conveyed into chambers containing hydrate of lime. The lime absorbs the gas, and in this condition it is as conveniently exported as the chloride of lime, so well known as a disinfectant, and so much used for bleaching purposes. The binoxide of manganese gives off its oxygen freely at a comparatively moderate heat; hence, its adaptibility for obtaining oxygen gas in large quantities and at a moderate cost. It is also employed in the manufacture of steel, by mixing a small quantity with ground charcoal, in the crucibles containing the iron to be smelted and converted into steel.

TAYLOR'S AUTOMATIC CHURN POWER.

Herewith we illustrate an automatic churn power, recently invented by Mr. John J. Taylor. The machinery necessary for propelling the dasher is combined in a compact form in a hollow and portable churn-lid, that may be so adjusted as to apply to and fit a churn of any reasonable size and form, and to propel a revolving dasher vertically or horizontally, and if necessary may be attached to an old-fashioned dasher working up and down; this is accomplished by setting the lid on its edge and inserting a crank in the hollow socket, *e*.

Fig. 1

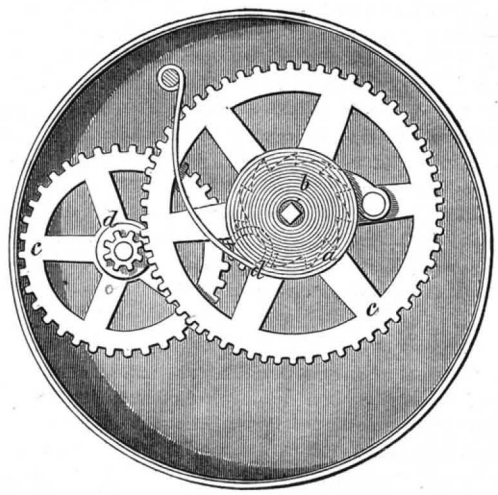
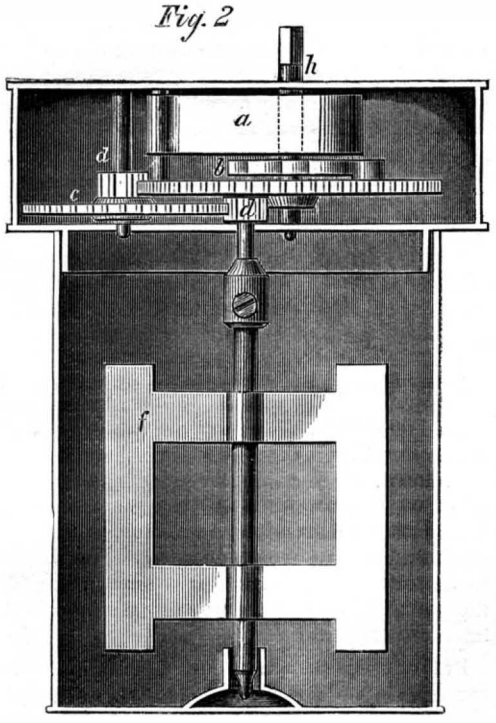


Fig. 1 in the engraving presents a view of the machinery in the lid, with the top plate removed. Fig. 2 represents a side view of a section of the lid, resting on a section of the churn. Similar letters refer to corresponding parts of the churn and lid in the different views. The helical spring, *a*, which propels the machinery, connects with the ratchet wheel, *b*, and shaft; *c c* are cog-wheels; *d d* are pinions in which the cog-wheels work; *e* is a socket connected with the last pinion, in which the shaft of the dasher, *f*, is inserted; thus forming a coupling between the dash and the lid, to be separated and connected at pleasure. The upper end of the mainspring shaft is made square, as at *h*, over which a crank may be applied for winding up the train of wheel-work.

Fig. 2



The advantages of this invention consist in its simplicity, cheapness, and compactness, and its applicability to any kind of a dash, or any size or form of churn. Those having churns need only to purchase a lid with this arrangement. The power can be so constructed as to run from thirty to forty-five minutes with once winding up.

This invention was patented Aug. 11, 1863, by John J. Taylor, Attica, Indiana, assignor to himself and E. Giles, of Washington city, D. C. Further information can be had by addressing Taylor & Giles, Washington city, D. C.

Why the Shelling of Charleston was Discontinued.

From the Boston Journal.

A gentleman of much intelligence, recently from Morris Island, where he had unusual facilities for observation and gathering information, has communicated to us a variety of interesting facts connected with the siege of Charleston, which throw much light on the state of affairs there. He informs us that the reason why Gen. Gillmore did not continue his bombardment of Charleston with the "Greek fire" shells, was because the shells sent were ignited on the percussion principle, and being discharged from a gun elevated at an angle of 38°, took their flight at the same angle, with a longitudinal rotary motion, base downward, and therefore struck base downward, instead of upon the percussion end, and did not explode. Only two are known to have exploded—one which fell in a warehouse and another which fell in the street. This peculiar motion and descent of the shell was a new discovery in artillery practice, then for the first time made, and the Ordnance Department was not furnished with a remedy for the unlooked-for contingency. To this fact alone Charleston owes the delay of the hour of its doom.

Time fuses, which will set matters all right, were at once sent for, and have doubtless arrived at Morris Island before this, and very likely Charleston is at this moment experiencing the dreadful effects of a shower of "Greek fire" shells, fifteen hundred of which have been ordered for the bombardment of that nest of treason. The gun from which the shells were first fired was a 200-pounder Parrott, which can throw a shell no less than seven miles, when aimed at an angle of forty-five degrees. The first shells went over Charleston, the gun being aimed at too sharp an angle. Our readers will be pleased to learn that Gen. Gillmore has no less than thirty Parrott guns mounted, that will throw shells plump into Charleston. Also that the use of Greek fire shells, to bombard that Rebel stronghold, was personally ordered by President Lincoln. The Greek fire burns for twenty minutes. It will burn on the water as well as on land, and each shell covers a surface of one hundred square feet with flame. The shell bursts into about one hundred and twenty pieces, or ten times as many as the ordinary shell. Of course the effect of these shells will be to set Charleston in flames which nothing can subdue.

In addition to the Greek fire shells, a large quantity of improved shrapnel shells, made by the inventor of the Greek fire shell, and containing from five hundred to one thousand bullets each, have been sent to Morris Island, to be transferred thence into the rebellious city in a manner not very pleasing to the enemy. These shells are fired with time fuses, and are very destructive of life. The celebrated 300-pound Parrott gun which Gen. Gillmore has, weighs 27,000 pounds. It took two thousand men nine nights to get the monster into position, the drag teams breaking down seven nights in succession, the enemy shelling the party all the while, and men being killed nightly. Nothing was done with it by day, the gun being covered with bushes to conceal it from the enemy's fire. The diameter of the bore is ten inches, the charge of powder 25 pounds, and the shell that goes out of it as high as a flour barrel, weighs 300 pounds, and contains 17 pounds of mortar powder. The execution of one of these shells on Sumter is considered equal to three 200-pound shells. But two of these immense rifled guns have been made, although twenty more have been ordered for the army. None have been ordered for the navy.

Gen. Gillmore at first had only one, but another has just been sent to him. The 300-pounder, when it exploded, was in charge of an infantry captain, who had never fired a cannon before in his life. He was cautioned that some accident would happen if he was not very careful. On the twenty-fifth round, the shell, containing 17 pounds of powder, was filled; the percussion fuse was screwed half-way down, and could not be got any further, when the captain said, "Let it go at that." The consequence was that, when discharged, the fire communicated down by the thread to the shell, causing the latter to explode before it left the gun, and breaking off 29 inches of the

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muzzle. The gun was repaired and got ready for use again in two days. It burst on Friday at 12 o'clock, and was firing again on Sunday as well as ever. These guns have been fired with 40 pounds of powder, and sent a ball through nine inches of wrought-iron plates, and two feet of oak timber by which the iron was backed. It has also sent a ball through 26 feet of earth. The larger a gun having a rifle bore is made, the steadier and truer the ball or shell is sent—indeed, the accuracy of a rifle is attained.

Mr. R. P. Parrott, the inventor of these guns, commenced making them in 1856, at his own expense, continuing his experiments without aid from the Government, until the rebellion broke out. He then began to make 10-pounders, and has now advanced from that small beginning to 300-pounders, and if successful will try a 2,000-pounder. Over 2,500 of these guns have been made by Mr. Parrott, who furnishes them at a less cost than the Government can make them at its own founderies; indeed supplying them at a trifle above cost, depending upon shells which he furnishes to the Government for his profits. Another fact which is very creditable to him is, that when the price of iron and of labor advanced, he did not raise his prices, although all the other founderies in the country did. About 33 of these guns, ranging from 300 to 10 pound caliber, are turned out weekly at Mr. Parrott's establishment, the West Point Foundry, at Cold Springs, New York.

The demand for rifle cannon is now so great that the founderies of this country are unable to supply them, and extensive orders are sent to Europe. The State of Massachusetts alone has ordered 70 from abroad.

THE FAIR OF THE AMERICAN INSTITUTE.

The Annual Fair of the American Institute was opened on Thursday, the 3rd inst., according to arrangement. We were not present at the formal inauguration, but have since taken occasion to visit the Academy, and our old friends the inventors. The internal construction of the building chosen for the exhibition is not suitable for the purpose, for many reasons. The general appearance of the goods is imposing, and pleasing to the eye, but in the darkness of the spaces under the galleries many of the smaller inventions are almost lost; and those afflicted with poor eyes grope blindly about for them. In the large open space of the parquette is gathered together a miscellaneous assortment of wares, goods, apparatus and instruments, of all kinds; and on the stage of the theater are house-furnishing goods, farm implements, &c., in great variety. Probably the building is as good as could be obtained for the purpose, but the visitor involuntarily asks himself why the Institute does not make arrangements to have some fixed locality to occupy, year after year, instead of moving from pillar to post, so to speak, with manifest derangement of their object and interests. In passing among the mechanical articles exhibited we were struck with their familiar appearance. Very few of the patented inventions on exhibition were strange to us: the rights to most of them having been procured through the Scientific American Patent Agency.

MACHINERY.

The steam engine is the prime mover of all machinery now-a-days, and we begin our observations with a notice of the only one that we saw on exhibition (a small portable one, made by Wood & Main, Utica, N. Y.) This engine was very neatly designed, finished as much as was necessary, and seemed strong and well put together. The boiler is horizontal and the engine also; it is set on the top, and strongly braced and fastened to its place. The SCIENTIFIC AMERICAN has been a persistent advocate for the adoption of small engines for general purposes, and this one seems to us good of its class. Doubtless, others will be on view before the Exhibition closes. Of the smaller steam engines, B. H. Horn exhibits a case of handsomely-finished, miniature, working models, in connection with drawing instruments, lorgnettes, &c. We have often noticed Mr. Horn's small engines, and wondered how he could sell them so low; a steam engine with quite a large cylinder and boiler being afforded for $10. H. Shlarbaum has also a small vibrating cylinder engine at the fair. The workmanship on this machine is very neat and well executed. Of the governors, or apparatus for regulating steam engines, there were three kinds visible at the time of our visit. Pomeroy's, made in Syracuse, N. Y., is new in its general principle and operation. It consists of a pair of circular disks fastened at the extremity of two arms, which are revolved at a high speed. These arms carry small rollers that run up inclined planes. This should be a very sensitive apparatus. The small model of the invention is one of the handsomest pieces of brass work we ever saw. This firm also exhibit a new throttle valve for steam engines, which consists of a slide valve, inclosed in a globular case and moved by a quick pitch screw, on which is a hand-wheel. This is a very convenient and useful valve. Pickering's governor is also novel in design, and consists of three vertical bow springs, to which are fastened at the center small balls; this also runs at a high velocity, and doubtless gives good satisfaction. Lyon's self-feeding drill machine is a desirable tool for small shops, it being intended to work by hand: by an ingenious combination of levers, the revolving balance wheel is made to feed the drill, while it also imparts its momentum to the work in hand. John Meyer, of Brooklyn, N. Y., has a drilling machine on exhibition, which, by the adoption of a universal joint, is rendered capable of drilling holes in all positions and places within a certain range; a desirable tool for drilling bed-plates or other cumbrous castings.

SEWING MACHINES.

These household friends were, as usual, visible in great force. The competing firms are Wheeler & Wilson, Grover & Baker, Wilcox & Gibbs, and the Sloat Elliptic. Criticism is unnecessary in commenting upon these machines; each pattern has its particular admirers, and all of them do what they were intended to. The external finish of the cases is beautiful, and the designs of the more costly ones show a high degree of artistic cultivation. The "Fairy machine," exhibited by Messrs. Wheeler & Wilson, is a particularly fine specimen of what this firm can produce. The case is much below the ordinary size, being suited to the proportions of the little lady for whom it was made, at a cost of $500. The exterior is lavishly ornamented with pearl, inlaid in a floral pattern, and the panels are beautifully painted. The running gear is all silver-plated, and of that special excellence of finish for which this firm has become eminent.

HOUSEHOLD MACHINES.

The inventor has invaded the hitherto *tabooed* precincts of the kitchen, and the consequence is that Bridget has had her work so much lessened in quantity, and the remaining portion so robbed of its terrors, that she incontinently demands higher wages at once and forthwith. This, we take it, is a striking proof that inventions, instead of decreasing the value of labor, enhance it. We take great interest in this department, as there is yet a wide field for the introduction of mechanical assistants. May the day soon come when some automaton shall reign in the culinary department, which shall be without "cousins," and also devoid of what is tersely known as "lip." Washing machines are present in large numbers, some of the inventors being Doty, Huffer, Avery, Heckrotte, and Cyphers. Our space will not admit of individual notice: but we presume when ladies enter the arena of invention the sterner sex will give way and allow us to notice theirs alone. The machine in question has a vibrating motion, communicated from a corrugated round-bottomed box or tub; this rolls over corrugated surfaces at the bottom, and doubtless does the work satisfactorily. The washing machines present are in operation, and housewives can satisfy themselves of their utility. There are also a number of mincing machines on exhibition, as also a dog power, intended to utilize the hitherto wasted energies of this animal, and to compel him to make the butter of his master by the sweat of his body. Fish's kerosene lamp heater is one of the most popular novelties of the day, to judge from the throng around it: the utility of it is unquestionable, and a great saving is experienced in heating and cooking small articles. So great is the amount of caloric given off by this oil, during combustion, that the apparatus in question, by a very simple arrangement of heaters and flues, can be made to cook meals for a great many persons, and this is actually done on an ambulance car on one of the railroads out of Baltimore. Clothes wringers are also extensively exhibited, and are meeting with a rapid sale. As yet patent churns are not numerous, but we noticed one which had a novel arrangement for breaking up the butter globules in the cream. It was simply two skeleton screws or ribs, wound spirally about shafts: these screws ran in opposite directions, so that the cream introduced to their attention would doubtless have a very unhappy time.

MISCELLANEOUS MATTERS.

Captain McDonald exhibits a model of a new casemated vessel for harbor and sea service, the peculiarities of which are, a strong impenetrable casemate, with round ends and corners, and bomb-proof roof. This casemate is on the main deck, and pierced for guns. The weapons themselves set upon a revolving platform, which brings each in turn opposite a port. Some very beautifully-finished models of steamers are exhibited, by J Simonson, Esq., of Green Point, N. Y., and one by John Englis, of this city. We also noticed a pear, from the Stuyvesant pear tree, on Third avenue and Thirteenth street, this city. This tree is now 240 years old, and, although in the sere and yellow leaf, still bears fruit. S. White exhibits a fine case of dental instruments, as also artificial teeth; and John Mathews has remarkably beautiful metal work, for soda fountains; the designs on these vases equal that of any imported work. Fred Kauffer has on view an exquisitely carved basket of leaves, birds and flowers, which look as delicate and tremulous as the originals; there are numerous other works of art and vertu which we are compelled to defer noticing till another week.

Greek Fire---Incendiary Shells.

Many persons have lately made inquiries respecting the nature of the incendiary shells called "Greek fire," which Gen. Gillmore has been throwing into Charleston. The Greeks were unacquainted with the use of bomb-shells, consequently their famous fire was not applied, like the fire shells thrown from the batteries on Morris Island. We gave a succinct history of destructive fire-shells on page 25, Vol. VI. (new series) of the SCIENTIFIC AMERICAN. The shell used at Charleston is stated to be the same in its composition as that of Henry Disney, invented in 1855. Its interior is filled with naphtha and phosphorus, or with the bisulphide of carbon and phosphorus. When the shell explodes, the fluid composition with which it is filled ignites spontaneously, and cannot be extinguished with water. Such incendiary shells are also claimed to be the invention of Mr. Greenough, of Boston. They are very destructive missiles.

Colored Troops in Hot Climates.

The comparative liability of white and colored troops to diseases of a malarious origin, has long since attracted the attention of the English authorities, and has doubtless greatly influenced the composition of their forces serving in malarious countries. From the annual report of the British army for 1859, it appears that in Jamaica the ratio of mortality is as follows:—White 101.9, black 8.2; Bahamas, white 159.0, black 5.6; Sierre Leone, white 410, black 2.4. These facts have an important bearing on the present policy of our Government, in organizing negro regiments for service in the malarious regions of the South. Already Surgeon-General Hammond has been able to contribute an item of statistical information bearing on this point. In a recent communication to the Secretary of War, he states that Medical Inspector Townshend reports that, in the Department of the Gulf, white and colored troops are found serving together, and equally subjected to malarious influences. The ratio of sick of diarrhœa, dysentery, remittent, intermittent, typhoid fevers, &c., is white 10.8 per cent, and colored 0.8 per cent. The argument in favor of the employment of colored troops at the South, if based on their comparative immunity from the diseases peculiar to that region, is conclusive.

THE Nova Scotia gold diggins, says the *Halifax Journal*, are flourishing. At Waterloo, Cold Stream, and Gay's River, quartz veins of eight feet in thickness have been discovered, yielding 39 ounces 4 cwts. to the tun. In the alluvion, 18 inches from the surface, nuggets and grains are found, yielding four or five dollars per day to the single hand, with pick-axe, shovel and pan. This is equal to Australia or California.

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IMPROVEMENT IN VESSELS OF WAR.

Universal interest attaches at this time to all inventions relating to ships-of-war, and their impenetrability or capacity to withstand a prolonged attack without serious injury. The talent of the whole world is at this moment occupied in solving the problem, and the results attained are visible in the vessels now building in the various civilized countries, which have interests to defend and rights to maintain. The naval vessel which is herewith described, is projected upon a different basis or plan from most others, and is strikingly original in its conception.

The primary object of this invention is to so construct a vessel that she may be penetrated by shot, without injury to her vital parts, machinery, armament or crew. This object is accomplished by forming that part of the ship above the water-line and below the upper deck, with a series of oblique-sided chambers, passing transversely through the ship, wide at the center and converging toward each side. The spaces between the said chambers will thus be funnel-shaped, converging from each side toward the center. The sides of the chambers are covered with metallic armor of moderate thickness, laid upon wooden sheathing, with a body of india-rubber or other elastic material placed between. The tops of the chambers are also metal-plated and incline downward at the ends, toward the sides of the ship. In the lower parts of the spaces between the aforesaid chambers, are masses of cork or other light material, extending up to the water line, so that, in the event of the spaces being pierced by shot, no more water can enter than will fill the space traversed by the shot, and thus the buoyancy of the vessel will be but slightly interfered with. The masts are constructed in tubular form, with a central tube of iron, and a body of india-rubber, cork, or analogous material, interposed between the said tube and the outer shell of the mast. The step on which the central tube rests constitutes a swivel on which the tube may turn freely, so that any shot striking the tube, on either side of its exact center, will turn it within its elastic case and thus glance off. To increase the elasticity of the surrounding material and the freedom with which the tube will turn, a small space is left between the tube and its casing. Above the upper deck are bulwarks, strongly iron-plated, projecting upward to a sufficient hight, and inclined inward from the perpendicular, at a sufficient angle to protect men and boats upon deck, from injury from an enemy's shot. The smoke stacks are constructed of telescopic tubes, with perforated conical ends, and may be let down to a level with the bulwarks, to preserve them from injury while in action. On the outside of the bulwarks are light iron bars, running fore and aft, and furnished with projecting pikes to keep off boarders. The said pikes may be raised and lowered simultaneously, by means of transverse connecting rods, worked by hand or by machinery. To protect the ship from the assaults of rams or other vessels, pivoted guard wings are employed, projecting from the sides, beneath the water. When not in use the said wings lay in parallel positions, against the sides of the ship, so as not to retard her motion; but they may be thrown outward at any suitable angle to sheer off the attack of a ram or other vessel, or to grapple and impede her motion and maneuvers. The space between the inner and outer skins of the ship is divided into water-tight compartments, from each of which a pipe rises, to the upper deck. In the event of fire occurring in the lower part of the hull, its locality will be indicated by smoke rising through one of the aforesaid pipes, and it may be extinguished by pouring or forcing water down the pipe.

The inventor of this improved war vessel is Jürgen L. Jürgens, Kingdom of Denmark. Parties desiring further information can address the inventor, care of Frederick Stromeyer, Box 4,897, New York.

The new postal currency will soon be issued from the Treasury at Washington. The new issue will be of the same denominations as the present, and of a uniform size; the paper will be thinner and stronger, and bear washing like cloth. By some chemical process in the manufacture, it cannot be photographed, as the color reproduced is very different from the original, and may be detected at once.

Saving Seed in the Vegetable Garden.

Shirley Hibberd, in his work entitled "Profitable Gardnery," says:—"Make it a rule to clear off every crop as soon as it ceases to be useful; and if your ground is not too large for you, never grow a single ounce of seed, except of any particular thing of which you cannot make sure of a supply. When you do grow seed, do not leave the worst plants for that purpose, but the very best you have; and give those as much extra culture as they will bear, for poor seed is not worth gathering, and there are few things that cannot be improved by bestowing a little extra labor in growing and seeding. Such things as peas and beans, if intended for seed, should not be gathered from at all, because the first pods are the best; if they are plucked, and a second supply depended upon, the seed will be inferior. In saving seed of potatoes, choose the best shaped, hardest tubers, that have no second growth on them: let them be thoroughly ripe before taking up. Choose those that are about the size of hen's eggs, and let them lie on a piece of dry ground in the fall sun for a week; then lay them in shallow baskets and stow them away, where they will be safe from frost, damp, and artificial heat; so that a free circulation and some amount of light can reach them. By February they will be green and hard, and little sprouts will be breaking; they are just in trim for planting. Of all other things, choose the very best for seed; for early things, choose those that are the earliest in the patch. Of things that are prized for bulk and weight, select the finest for size and general perfection; gather all seeds just before they are dead ripe, and dry them on a piece of cloth or sacking, so that if any shell out they may not be lost."

A Butter Factory.

The New York *Argus* advocates the erection of a butter factory, and thus sets forth some good reasons for the inauguration of such an enterprise:—"1. The women in every farmer's family, where butter is made, would be benefited by the relief from drudgery which the new system would bring. 2. The proposed mode would admit of introducing all the known improvements in the production of the butter. The milk would be measured and the butter weighed, so as to indicate exactly how much milk is required to make a pound of butter—the milk and cream would be kept at all seasons under proper regulations at the proper temperature—the cream would always be churned at exactly the same temperature—the butter would be stored in a proper cellar, where it would always keep well. 3. Water or steam power would be used for churning and working, thus saving a vast amount of labor and expense. 4. The butter would all be, under proper management, of superior quality, and at all events of uniform quality, and thus sell at an enhanced price.

"There can be no doubt whatever, we judge, that if the milk from five hundred cows in any neighborhood should be brought to the factory together, and the butter manufactured from it according to the best known method, the net sales would be sufficiently increased to pay for the entire expense of the operation."

We have long felt that the manufacture of butter might be made a profitable enterprise, as there is no field of labor that presents such an opening for the introduction of machinery. The price, however, would be much lower, and the profit greater, as is always the case where any process is expedited. The market value of butter has ruled all summer at 27 and 28 cents for wretched stuff. It would seem from this fact that there is great need of a little Yankee energy and ingenuity in butter-making.

The "Dictator."—In a letter of recent date to Epes Sargent, Capt. Ericsson writes:—"The *Dictator* is fast approaching completion, with her 10½-inch side armor and turret 15 inches thick. Her new wrought-iron ordnance is also nearly ready. Mark my word: this vessel will as surely prove a *Dictator* as the first one of her class has proved a *Monitor*."

Female Shoemakers.—Shoe-making is done extensively in Haverhill, Mass., by the women. The *Banner* says they "work in gangs of six or seven hands each, the same as most of the young men do; and make the shoe right straight out, from the lasting to the finishing.

Gold Product of the World.

It is stated in the *Banker's Magazine*, upon what is held to be reliable data, that the production of gold and silver has quadrupled since the discovery of gold in California in 1848. In 1847 the annual production was estimated at $61,000,000; Russia and Mexico being the principal sources. The product for the current year is estimated at $270,000,000. A careful scrutiny of the whole subject, as to sources of this supply, serves to show that North and South America produce about $96,350,000 in gold, and $47,650,000 in silver; a total of $144,000,000. Australia, Russia, and other portions of the world, produce annually $108,230,000 in gold, and $19 345,000 in silver; a total of $127,575,000. The annual average of the "gold crop" of California is set down at $60 000,000. The effect of this accumulation of gold is thus stated:—

The vast accumulations of gold of the last fourteen years enure largely to the benefit of the United States and Great Britain, by giving an impulse to commerce and to manufactures. Remote nations are indirectly benefited, because the course of trade is such that gold will flow to those countries where labor is cheapest, and where the bullion and coin are the most valued, or realize the largest results. This is fully demonstrated in the fact that, notwithstanding the additional accumulations of the precious metals within the past fourteen years, amounting to over one thousand millions of dollars, there is really but little more on hand in the United States and Western Europe than in 1850—1853. In the year 1851 the bank of France held four hundred and eighty-six millions of francs in silver, and eighty-two millions in gold; whereas now, after a period of twelve years, it holds three hundred and ninety-four millions in both metals. In the year 1862 the Bank of England held £22,000,000 in bullion and coin, which was, in fact, for the country at large: the joint stock banks, country banks and private bankers maintaining but small specie reserves. This year the bullion and coin of the Bank of England ranges from fourteen and a half to fifteen and a half millions sterling, and the Scotch and Irish banks £4,270,000, from which we deduce the following comparative table:—

	1852.	1863.
Bank of England	$110,000.000	$ 75,000,000
Bank of France	113,000,000	80,000,000
Banks in the United States	84,000,000	118,000,000
Total	$307,000,000	$273,000,000

Annual Fair of the Maryland Institute.

The presence of war and the close proximity of armed bodies of the enemy, does not seem to have had a depressing influence on the manufactures and arts of the Middle States. In places remote from the scene of conflict the arts of peace flourish undisturbed, but it is not a little creditable to the Middle States that they are enabled to gather into their halls and show-rooms the products of the industry of their inhabitants. The Maryland Institute, at Baltimore, inaugurates its Sixteenth Annual Fair on the 5th of October next, and it will continue open for one month. The managers pledge their best efforts to secure a satisfactory and creditable exhibition. Competent judges will be appointed to decide upon the merits of articles on exhibition, and every effort will by used to secure impartial decisions and to make just awards. A business notice of the Fair can be found on page 191 of the present number.

Coal Supply.—The Philadelphia *Ledger* of the 5th inst., states that the number of tuns of coal forwarded at that date, for the year, amounts to 6,073,655 tuns, against 4,807,893 tuns for the same period last year: being a net increase of 1,265,762 tuns. The operations at the mines are prosecuted with vigor, and it is the opinion of operators that coal is now about its highest point. The retail price of coal, egg size, in New York, at present, is about $8 per 2,000 lbs.—not a tun by 240 lbs. Coal is nearly double the price it was three years ago.

Two petrified men have been found near Castlemaine, Australia. They were in a sitting posture—veins, muscles, finger nails, &c., all perfect. One had a stone axe by his side.

Coal-oil is a most effectual remedy for bed-bugs. Apply plentifully with a small brush or feather to the places where they most do congregate.

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The Month Malign.

September gives rise to more disease in town and country together than any other month of the year. It is fruitful in diarrhea, dysentery and fevers of every grade, from common fever and ague to the most malignant form of bilious, congestive and yellow fever. The immediate causes of these maladies are the hot days and cool nights, in conjunction with the habits of the people. Few persons have hearty appetites in hot weather—our instincts are too wide awake for that; but we too often drown our wise and steady and gentle monitions, in the clamor of the animal nature for stimulants, to whet up the appetite to hurtful and destructive activities. The proprietors of the most fashionable hotels in New York have asserted that, if it were not for the "profits of the bar" they would have to close their doors. Doubtless, in almost all cases, these "profits of the bar," are a very important source of income to all taverns. We have certainly noticed that a number of temperance hotels succeed in collapsing in a very short time. When the stomach is taxed beyond its ability for work, by eating to the fill of a stimulated appetite, one pernicious result always follows, and a different one is impossible in any single case in a century of centuries; the food is not perfectly assimilated—cannot be made into good blood; and, being mixed with what was already in the system, makes "bad blood" of the whole. The entire mass is a vitiated article, and becomes more so by each act of over-eating, by every mouthful swallowed to "get up an appetite." The whole mass of blood being thus corrupted, it is no wonder that persons living so are liable to complaints in all parts of the body; for this vitiated blood goes everywhere; and, never feeling well, they are always "taking something." In this way the body soon loses its vigor, its capability of resisting causes of disease, and warding off sickness; a state of things plainly proven and unwittingly acknowledged in the now very common expression: "The slightest thing in the world gives me cold." When such is the case, it is always because he so speaking has not much stamina; in other words, is full of "bad blood," whatever may have been the cause; whether from taking tonics, stimulants, or bitters, to wake up an unnatural appetite, or whether from "forcing" food; eating without an appetite; or merely from a vicious indulgence of the animal nature. When persons have for some time eaten more than the system requires, they lose their appetite; have a bad taste in the mouth on waking up in the morning; are more or less uncomfortably chilly, and are fit subjects for any cause of disease which may exist in the atmosphere. They are the very first victims to any epidemic malady; if anybody is sick they are sure to be among the number. This general cause of disease existing in the atmosphere is always generated in the latter part of August and during September; it is called miasm—an emanation from decaying vegetable matter, mud, leaves, plants, roots, &c.; it is distilled death, literally, because the heat of the noonday sun, acting upon matters like these, causes the deleterious agency to rise up, like alcohol or whisky from a still. When the cool of the evening comes, this air is condensed, becomes heavy, falls to the surface, and is breathed by whole communities, sometimes breaking out in a night and destroying hundreds before the morning. In such cases the temperate, plain-living and industrious, are the very last to suffer, if at all, because they have good blood, which has a "power" to resist disease. The lesson is, never attempt to "whet up" the appetite, except by creditable labor, or moderate, steady, continuous out-door activities.—*Hall's Journal of Health.*

Planting Strawberries in the Fall.

Many persons believe that spring is the best time to plant strawberries; but the *Ohio Farmer* seems to be of a different opinion, and gives the following directions for fall-planting:—

"When plants are well set in the fall, they will fruit the next season, as it is the fall growth of root which supports the plant for next year's fruiting. Go into your garden to-day, and pull up a strawberry plant which has fruited this season, and you will see the old stock of roots dead and black, and from the crown of the root beneath, a set of new roots putting out: these must make a good fall growth or you will get no considerable crop of fruit next year; and transplanting now causes a less jar in the natural condition of the plant, than if taken up at any other period of the year.

"Choose for planting, young runners that are well rooted; then on a cloudy day proceed with your work. Draw a line where you desire to plant and mark a place for the row; spread out the roots evenly on all sides, set in so as to bring the dirt well up to the crown of the plant, without covering it, and press the soil down firmly with your hands around the plant. If the weather should prove dry, water thoroughly, so as to soak the roots, as often as the foliage shows by its drooping appearance that water is necessary.

"Before the setting in of winter, cover the entire surface of the ground, over the plants and all, with a litter of straw or other like material, to keep the plants from the changes of freezing and thawing, to which they would be exposed if left on the surface where the sun and winds would have full play upon them. This covering should be removed in the spring, so as to let the plants grow up without hindrance. The fruit buds are formed in the fall, and if these are injured during the exigencies of winter and early spring, the crop of fruit will be lost.

"Strawberries, like grapes, need a generous strong soil, but not decidedly fat, and especially not recently stanched with green or raw manure. If manure is needed, let it be fine, old, well-rotted compost, and let it be thoroughly mixed with the soil, which soil is best to be a deep loam, though some varieties, as the Early Scarlet, will flourish in sandy soils. A moist soil is always best for strawberries."

The Summer Hegira.

A most advantageous custom, and one which promotes health of body and brain, is that of citizens spending the hottest weeks of the year in the country; there cannot be a doubt of its revivifying and regenerating effects, when the time is occupied in a proper manner, and the habits of eating, drinking and exercise are dictated by a judicious reference to the ascertained laws of our being. A summering in the country will be beneficial to the body, in proportion as the whole time of daylight from early breakfast until sundown, is spent in active pleasurable exercise in the open air; exercise which, as often as taken, should be to the extent of some little fatigue. As to young men and old, the best plan is to be afoot from morning until night, in fishing, hunting wild animals, religiously sparing the sweet birds of the wood, whose gleeful songs, as if in welcome of our arrival, ought to smite any generous heart with reproach, for even the thought of murdering them in cold blood. To carry out this plan of health seeking to the fullest extent, it should be arranged to go far from human habitations, and "rough it," camping out every night for weeks together, all the while dismissing business from the mind, and allowing it to feast on the beauties of nature and the goodness of our great Father, as exhibited in all that meets the eye.

As to girls and women, especially those who are burdened with family cares at home, or are weighed down with that great load, fashionable life, the better plan is to avoid all watering places, and away from all steamboat and railroad communication, seek in some quiet nook, in a plain, tidy farm-house, that repose for mind and body which is so imperatively needed. A place should be sought where there are literally "no other boarders," except the members of your own family, and where there is no pretension in the household to dress and form and ceremony; where the only law is that of an honest kindness. Seek a place where there are no near neighbors; which is not immediately on any main public road; the object of all this being to enable the ladies, without wounding their self-respect, to wear the plainest, loosest clothing they possess, and to relieve them of any necessity for dressing but once in twenty-four hours, and that when they first get up in the morning, so that any moment they may wish to go out of doors, the only extra articles needed may be an old-fashioned "sun-bonnet" and a loose, light shawl. The shoes that are worn about the house should have soles nearly half an inch thick, with cork lining inside. When a lady can go out thus easily, without the necessity of changing a single garment, she will be far more apt to take a turn round the farm, to go to the spring-house, to go out to the harvest-field and smell the new-mown hay, to scale fences, climb trees in the orchard, gather wild flowers, build mill-dams in the brooks, and construct artificial canals and miniature water-wheels for turning imaginary mills. To take basket on arm and botanize; or a tiny hammer, and wandering over brook and branch and hillside and mountain-top, by the public road or the sea-side, read in every stone the geology of each locality, and much of their history through the long ages past. To row a boat, or ride a horse; to walk by the earliest dawn, or frolic by the clear moonlight of summer; all the while eating not an atom except at the three regular meals of the day; getting all the sleep possible, but only during the hours of darkness. Acting thus, few will fail of real and lasting renovation, by spending a summer in the country.

The Coal Mines of Monte Diablo, Cal.

In a California paper we notice a very interesting account of coal mines, of which we present a synopsis:—

The first mentioned is the Parrott mine, near Clayton. A shaft 300 feet was sunk in it; but the coal proving too soft, it was abandoned. Three other mines are worked in this vicinity—the Carbondale, Cumberland and Black Diamond. The last is worked 1 500 feet into the mountain and yields excellent coal. The vein is four feet two inches thick; and the mine is well ventilated by furnaces at its mouth. The miners earn $3 a day. The coal is carted to the river, and shipped to San Francisco, where it readily sells for $9 a tun. There are many other veins in the vicinity of Devil Mount, all of which are worth working. The cost of transportation and high price of labor, are obstacles to the successful working of some of these veins. The coal interests of California are sufficient to enrich the State and make it independent of all other countries. The author of the sketch begins with this pretty compliment to the scenery along the road:—

"Leaving the busy little town of Clayton, the route immediately becomes interesting, by reason of several vineyards and orchards, that give to the scenery a very pleasant contrast with the dry and seared pastures on the one side, and the wild and grand uplifted peaks of Diablo, that rear their black heads over and above, while along the sides of the mountains are often seen excavations and neglected tunnels, the result of prospecting after coal, or copper, or some hidden treasure. No one who looks from a distance upon dark Diablo would ever conceive of the broad and pleasant valleys, or of the orchards, gardens, and fruitful fields, that are hidden among the many hills high up—many valleys, miles in extent, and of as rich land as can be found in any part of the State, and far superior to some that are in high repute. We found several fine farms, of which we have spoken, and others we had not time to visit, that are laying the foundations for future success and prosperity."

Silk Culture on the Isthmus of Suez.

Mr. Sala, inspector general of the Suez Canal, took formal possession in 1861, of El Waddy—an extensive grant of land made to M. Ferdinand Lesseps, by the Pasha of Egypt, for the benefit of the Suez Canal Company. The land has evidently been once in cultivation; and it is said that a colony of Syrians formerly bred silk-worms successfully on it. A few hundred mulberry trees are all that remain among the village ruins. In 1862, M. Lesseps ordered a new attempt at silk culture on the estate. Thousands of mulberry trees were planted, and silk worms enough raised to furnish eggs for the year 1863. The mulberry leaves may be used the third year after the tree is planted. So far, the attempt has been a complete success, despite the inexperience of the Arab employes. The soil of this part of the desert has been found particularly suitable to mulberries, as it also is to cotton, owing to the abundance of the fertilizing Nile water, furnished by the main canal feeder. This new enterprise may be an important source of revenue to the Suez Company, which is in correspondence with the Imperial Silk Company of France. As it is found impossible to raise eggs in France, the Suez Company may furnish that indispensible article, as well as cocoons, which formerly were imported from Italy and China.

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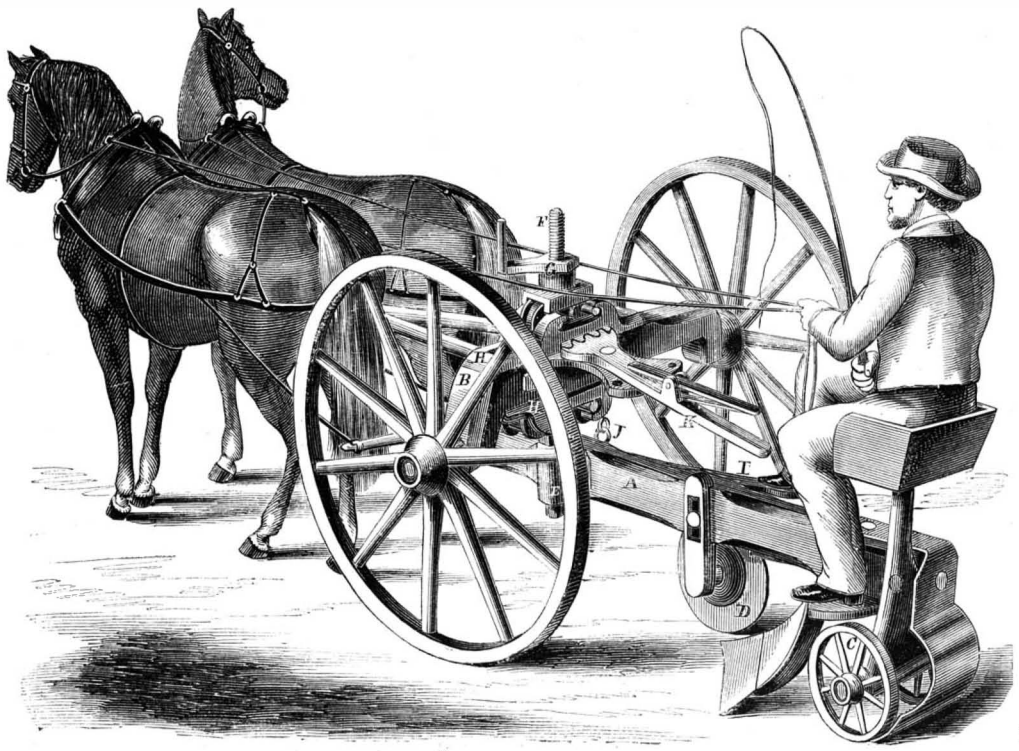
HUNT'S IMPROVED PLOW.



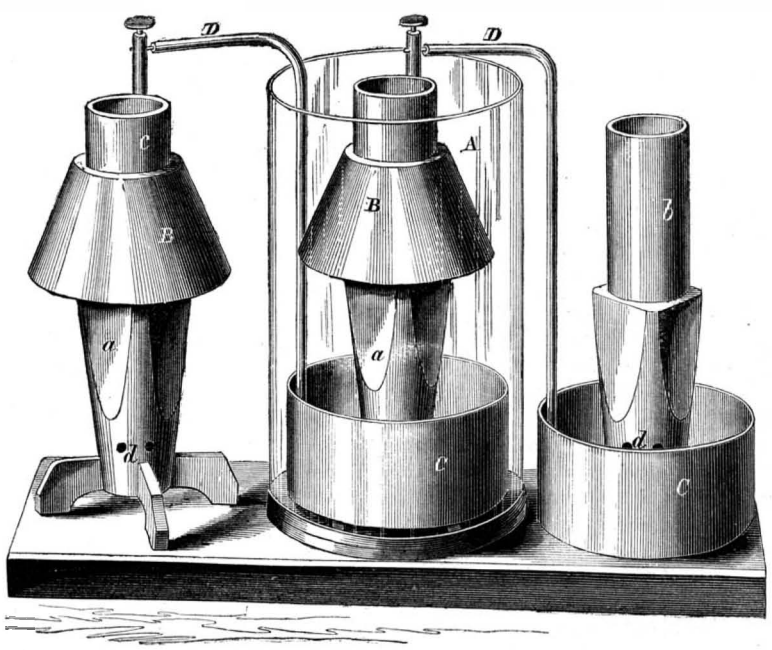
Improved Plow.

This invention consists in the arrangement of a vertical coupling and adjusting pin, which has that portion which passes through the beam, round, and that part which passes through the axle, square. In combination with this there is a diagonal adjusting bar, a hand lever, and toothed rack. By these arrangements, the beam, with its attachments, is allowed a chance to play up and down, according to the undulations of the soil, on the land side of the plow, independently of the axle; and the axle, with its wheels, can swing around horizontally, independently of the beam, so as to turn a corner readily. The invention consists, also, in the arrangement of a long slot in the axle, with an upper and under slotted sliding plate, and coupling and adjusting pin. By this arrangement the plow can be set so as to plow to a greater or less depth, and yet always have its sole resting square upon the bottom of the furrow. Appended is a full description of its several parts :—

The tongue is attached to the beam, A, at its forward end by means of a loop and clevis, and on the rear end of the beam a driver's seat is mounted. The beam is suspended near its front end on an axle, B, on two propelling wheels of different dimensions, and has its rear end supported by a third wheel, C, as shown. The plow is arranged about midway of the beam, as usual. A revolving coulter, D, is arranged, as shown, in front of the plow. The upper end of the coupling pin, E, which couples the axle and beam together, is made round, and has a screw-thread, F, cut on it. This pin passes up through a round hole in the beam, and an oblong slot in the axle, and is confined in place from vertical play by means of a nut, G, which latter screws on its upper end. It will be observed that the pin extends up some distance above the top of the axle, so that it may, with its attachments, move up and down on the square part of it, accordingly as the undulations of the soil operate upon the landside propelling wheel, and thus avoid lifting the plow from its position. A metal tube surrounds the exposed part of the coupling pin, and protects the screw-thread from injury as the axle moves up and down over it. On both the top and bottom of the axle a slotted plate is arranged. Set-screws pass through the axle and slots of the plates, H, and the coupling pin passes through square holes in said plates, and thus has no lateral motion independently of the plates. In lowering the plow down by the screw and nut of the coupling pin to run deep, its point is pitched down, and in order to restore the horizontal position of its sole, it is only necessary to move the upper slotted plate to the moldboard side, and the lower plate to the landside, thus inclining the coupling pin, and causing the beam to take such a position as will throw the base of the plow horizontal. A treadle, I, is pivoted to the front of the beam, and connected by a link, J, to the rear of the axle, and extends back to the driver's seat. This treadle enables the driver, with his feet, to raise and lower the front end of the beam and plow, as occasion may require. A connecting rod is hinged to the landside end of the axle, and there pivoted to a horizontal hand lever, as shown. By this arrangement the plow can readily be turned round a corner, as the axle, being allowed to turn on the round part of the coupling pin, can by this be made to assume any desired position. The hand lever, K, has a toothed quadrant worked on the end of it, which gears into a rack on the slotted plates, H. This will be found a most desirable feature in plowing short furrows, or in new land where stumps are thickly scattered about, and other obstructions which tend to embarrass the operations of the farmer. This plow is said to be very light in the draft; so much so that a small boy can readily manage it.

The entire patent, or the right for territories, is for sale. Patented March 27, 1860. A second patent on this invention has also been ordered to issue, through the Scientific American Patent Agency. For further information address the patentee, George W. Hunt, Moscow, Iowa.

HILL'S GALVANIC BATTERY.



Improved Galvanic Battery.

The battery of a telegraph is like the boiler of a steam engine; it is the source of power. And so far as it relates to efficiency and economy, there is just as great a difference in the arrangement of the elements of a battery as there is in the arrangement of furnaces, flues, water and steam spaces of a boiler. A current of electricity is generated in a battery by the decomposition of the aqueous fluid contained in cells, and two elements (usually of metal) are employed to secure this result. One of these elements is called the positive electrode (because it is the most easily decomposed), and the other is called the negative. Zinc is the more common positive, and copper the negative electrode.

A represents one jar of the battery, complete, except the fluid elements, B, being the zinc electrode, C the copper, and D the gutta-percha covered connecting wires; *a* is a standard made of any suitable non-conducting material, which is at once a support to the zinc, and a receptacle for the sulphate of copper; *b* and *c* are the two other supports, bearing electrodes connected with A on either side, *b* is the copper alone *in situ*, and *c* at is the zinc alone. At *d* are small holes, near the bottom, and communicating with the hollow of *a*.

Operation—The different parts being arranged as in A, a strong, but not saturated, solution of sulphate of zinc, or of common salt, is poured into the jar, sufficient to nearly cover the zinc; then a small quantity of sulphate of copper, in crystals, is dropped into the tube, *a*, which there dissolves and runs out through the small holes, *d*, covering the copper electrode, but not coming in contact with the zinc. After this is done, care must be taken not to mix he blue and the white solutions. On closing the circuit, a strong, constant and uniform current is evolved, and will continue while there is zinc to be acted on, sulphate of copper to decompose and water to dissolve the oxide of zinc. If the zincs are pure, the battery may be maintained as long as they last, by simply adding sulphate of copper, in small charges, every two or three days, and keeping the sulphate of zinc sufficiently dilute—say from 25° to 35° Baume's hydrometer.

Such a battery, of 200 cups, was put up in Chicago, for the Illinois and Missouri Telegraph Company, on the 27th of February last; and is still running constantly. The zinc solution has been reduced with water on an average once in ten to twelve days. The zincs, when new, weighed 2½ pounds each, including binding screw and arm; the coppers were each 2 by 5 inches copper sheathing. The whole battery consumed 700 pounds blue vitriol of commerce in four months, which is equivalent to about 185 pounds of zinc dissolved, and 185 pounds of copper deposited. The inventor says he has watched it closely, testing often with galvanometer, both at Chicago and Galesburg, Ill.—268 miles distant, and thinks the circuit, for strength, is fully equal to Grove's battery, previously used; while for constancy and uniformity of distribution it is superior, and for this reason, that the current generated by a large Grove battery partakes very much of the nature of lightning, and tends to escape to the ground, where the insulation is not absolutely perfect. The chief advantages of this battery are economy in material and labor, and constancy and uniformity of action; and it comprises the desirable features of such apparatus.

Further information in regard to this battery can be had by addressing the inventor, Mr. E. A. Hill, telegraph operator, at Galesburg, Ill.

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ZINCED IRON FOR SHIP'S PLATES.

The results of a very interesting series of experiments, with galvanized iron plates immersed in fresh and salt water, have been communicated to the London *Mechanic's Magazine*, by F. Crace Calvert, the distinguished chemist of Manchester. Associated with Mr. Richard Johnson, in 1858 he commenced the experiments, with several iron plates laid in contact with thin sheets of zinc. A certain number were immersed in salt, and an equal number in fresh, water. These plates were examined at the end of one, two, and three months; and it was found that the zinc had exercised a most remarkable preservative effect upon the iron. The result of this experiment induced the investigators to undertake others of a more practical character. They obtained several plates of galvanized iron, three inches square, and an equal number of iron plates of the same size but not coated with zinc. These were carefully attached to pieces of oak of the same size, and a certain number of galvanized and unzinced plates were placed in soft, and an equal number in salt, water. After being immersed from January 3d to March 5, 1862, they were taken up, when it was observed that the iron plates which had laid in the soft water had lost, by corrosion, 1,230 grammes, and those in salt water 2,380 grammes—or more than double. On the contrary the galvanized plates in soft water had lost only 0·125 grammes; and those in salt water but 0·090 grammes. The same plates were again submerged until May 1863—a whole year—and were then lifted, washed, dried and weighed. By this immersion for twelve months the uncoated iron plates lost, by corrosion in soft water, 1·550 grammes; those laid in salt water 4·280. But galvanized plates in distilled water lost in the same time only 0·830; those in salt water 1·220 grammes.

With respect to the experiments Mr. Calvert says: "These results leave no doubt of the great protective power exercised by zinc against the corrosive action of water, and especially of sea-water. I therefore think that all iron used in shipbuilding should be galvanized, and I cannot see any commercial objection to its general adoption." He also states that all iron used in shipbuilding, when laid against wood, especially oak, should be galvanized; because oak is rapidly deteriorated by the presence of the oxide of iron. The gallic and tannic acids in the oak act upon the oxide of iron, causing rapid decay, or *eremecausis*. Iron bolts and screws were also galvanized, and driven into blocks of oak, for the purpose of ascertaining whether the zinc would be rubbed off; but in no case was the zinc coating injured. Galvanized zinc bolts are used by our American shipbuilders in the construction of wooden vessels; but the experiments of Messrs. Calvert and Johnson should lead to the application of galvanized iron for straps, braces, and indeed for all the iron which is employed in ships; more especially the plates that are to be submerged in water.

In addition to the above useful information, we observe that a patent has lately been granted to M. J. Pierre Jouvin, Professor of Chemistry in the Naval School of Medicine, at Rochefort, France, for preserving iron-clad vessels from corrosion, by uniting thin zinced plates to iron plates; and it is stated that the French Government are now covering two iron-clad vessels according to this system. The inner iron lining of the sides and bottom of the ship are first scoured; the thin sheets of zinc are then secured directly against the iron. Professor Jouvin has also applied a very poisonous paint to the exterior of iron vessels, to prevent the adherence of barnacles, &c. This paint is a compound of turpeth mineral (persulphate of mercury) and Prussian blue; consisting of about 55 parts of turpeth, and 45 of Prussian blue, which is ground and mixed with red lead in linseed oil. Before it is applied, however, the iron is covered with two successive coats of zinc paint, each of which is allowed to become dry. This is necessary, as iron possesses the power of reducing compounds of mercury. The chloro-cyanide of mercury, which is produced by the contact of this mercury paint with salt water, is a poison so powerful that the least particle of it will instantly destroy the life of marine animalculæ. Mr. Calvert's experiments afford proof that sheet zinc in contact with iron in water preserves the iron from corrosion; and M. Jouvin's invention, consisting of the application of sheet zinc to the inside of an iron ship, is based upon this scientific fact. Galvanized iron, however, appears to be the most convenient form of applying the principle.

HANDS versus WHEELS.

Hands are the representatives of slow, out-of-vogue or obsolete methods of doing work. Wheels are the representatives of tools—active, skilful, certain in their operation and results. Why should a man use his hands when he can employ wheels? Why should he bend his back and stretch his sinews until they crack again, when there should be tools to take up his task and laugh at it, where man groans over the complexity and toil involved before it can be perfected. Look at the stock of a Springfield rifle; see all the recesses, the shoulders, angles, and the difficult shape it presents to make mechanically: yet it is all made by special tools devised by the brains of ingenious men. Look at the countless varieties of beautiful moldings and carvings executed by the fingers of machinery: look at the hook of a Wheeler & Wilson sewing machine, and then say with truth that there is no form or shape of furniture, tools, or utensils that cannot be made with tenfold greater celerity than by the slow processes of manual labor.

Clothes-pins, broom-handles, the sashes in our windows—these are all produced by machinery, and very ingenious combinations of it; and there are a dozen other different articles made by hand, in common use about the house, which ought to have special apparatus provided for them. Why does not some enterprising inventor set to work and make a little apparatus for keeping the bottoms of smoothing irons clean and bright, so that linen would have that gloss so generally admired; and then for cleaning the chimneys of kerosene lamps—a difficult task at present; a convenient machine for mincing apples or meat, or a mill for grinding family spices. These latter, as sold in the stores, are tasteless, and always will be so, no matter how pure they may be originally. The paper covering absorbs the aromatic oil, or else the same is volatilized and dissipates the flavor. These, and other suggestions, which will occur to most persons, might be followed up with good results. Hands against wheels must give way, even in the kitchen. There is no utility, however, in providing machines to do what could be done more expeditiously by hand; of this distinction the good sense of the individual must be the judge. We do not require apparatus to pick up handkerchiefs, or perform similar duties; but what is needed is to economise time and labor, by employing mechanism that will move faster, work longer, and do more than tired flesh and blood can. Then the agent, whatever it may be, is a decided acquisition. What is true of the household is equally so of the field and the factory. If clothing is dear, it is because the materials thereof are high, or else the demand cannot be supplied; in either case there is a palpable want of improved machinery, to lessen the time required to make garments, and thus reduce the cost to the consumer. In all the highways and bye-ways of the world of science and art, there are at this moment processes, halting and slowly carried on, which imperatively demand more wheels, or, in other words, improved tools. Reflection will show every practical man that this is true, and there are, doubtless, at this moment numberless individuals who have new inventions which they intend to bring before the public, but are deterred, perhaps, by some undefined and inexplicable hesitation. For some the draft has dangers; to others the price of gold becomes entangled in their calculations; in short, this neglect to bring out the cherished plan may be explained in one word, which is "carelessness." Delays are dangerous. While you are deliberating, oh! inventor, another may reap the golden prize. Stretch out your hands ye that labor or lounge, and if you have the result of years of study and toil at length completed, secure it, that your reward may be certain and sure.

THE HAMMER MIGHTIER THAN THE PEN.

We read that the pen is mightier than the sword; reasoning metaphorically the statement is true. But the hammer is more powerful than either, by the argument that deeds are more cogent than words. The pen inspires mankind to great efforts by the glowing words proceeding from it. The sword hacks and carves a brilliant fame for him who wields it: but before its advance the nations of the world shrink back in dread, and women and children cower in fear. By the light of the bursting shell, or the glare of dwellings in flames, it stands out and gleams balefully against the sky, and only over human anguish and agony does it stride to triumph and renown.

Who ever feared the hammer, or its deeds. Those that rush across the plains of the West, or the hills of the East; they who plow the waters of the rivers or the ocean; these experience the triumphs of the hammer, know well its power, and how indispensable it is. The pen may stimulate and incite to greatness, but it cannot achieve it; the sword bends all things to its will, but it burns like a consuming fire, and mankind writhes in agony before it. Only the hammer is all-powerful and peaceful. By it thousands live and grow rich. With it men amass wealth and build up the bulwarks of the nation; hunger is kept at bay and famine is put to flight; peace exalts her head, and hard-fisted toil finds no time, leisure nor inclination, to wreath the brow of Mars. The pen bows to the hammer and does it homage. A man may live in physical comfort without a book in the house, but he cannot exist without being indebted to the hammer or its equivalent. The pen sings the praises of the hammer, and indites eulogiums upon its numerous achievements; few are the monuments the hammer deigns to raise in honor of literature. The pen is mightier than the sword, because it achieves its object through reason and not force, and also in that it is infinitely more civilizing and humane in its effect upon the world; but the hammer conquers even more territory than the pen, and is, in its way, invincible. No country is too remote, or any wild too savage to resist its weight, nor any metal, wood or vegetable powerful enough to defy it. Without the hammer—a symbol of toil, as the pen is of thought, and the sword of violence—the world could not exist in comfort and refinement.

PIECE WORK.

There is, it appears, a general and growing inclination, all over the country, in favor of the system o "piece work," or of allowing each man to earn such wages as his skill and abilities enable him to. In favor of the plan there is much to be said, while in discouragement of it there would seem to be very little ground for objection. In the first workshops of the country the system of piece work now very generally adopted; and the best conducted and most prosperous establishments are invariably committed to this method of carrying on their business. In proof of this assertion we may point to the Wheeler & Wilson Sewing Machine Manufactory, to the Waltham Watch Company, and others we might name, all working by the piece. We presume no one will deny that if the piece work plan will answer in these places, there can be little doubt of its success in other branches of manufacture, which do not require as much care and constant oversight as those above mentioned. It has been asserted in condemnation of allowing operatives to work as fast as they chose, that the quality of the article produced was much inferior to that made by day work. This statement

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is transparently illogical, when we view the splendid work turned out by the companies enumerated, and bear in mind the competition they are subjected to In favor of piece work it may be said that the strongest incentives are laid before the workman to exercise all the latent talent and ability he may possess The factories in this country that produce a standard kind and quality of work, as pistols, sewing machines, &c., have special tools for the accomplishment of their objects, which tools are run by the workmen; possibly they do not accomplish as much as they might; if a certain device was applied on some part they would do double duty. The man in charge sees this, because it is for his interest to: it will increase his wages; the addition is made, sometimes at his own expense, and involving quite an outlay; for the workman is satisfied to give ten, or a hundred dollars, where he knows that he will receive a thousand in return. This is largely to the advantage of all parties—the concern and the artizans—and it is also a direct acquisition to the world of art and science. If any person wishes to inspect model machines—those that approach the nearest to human intelligence—let him visit some of our best conducted manufacturing establishments, and he will see what the system of doing work by the piece tends to encourage and develope.

When a man is hired by the day, he gets his wages (if not notoriously idle) even if he does not accomplish nearly as much as his neighbor; but when he has a stimulant held out before him to double his task, it induces him to strain every nerve to accomplish it. We have heard it asserted that piece work tended to make men dissipated and demoralized, by the large wages they earned; that they neglected their families and became idlers, &c., but this is a very weak argument against the system. Piece work is not intended to force moral convictions upon a workman's mind; if he have not these principles instilled in early youth, he is of little value as a craftsman, either by the piece or by the day. Piece work is an acknowledgment of a man's right to earn all he can; while a certain amount of hire weekly virtually limits his capacities to the sum allowed Men work by the day pretty much as they choose whereas if they are awarded contracts in themselves so to speak, they are more apt to execute them faithfully and quickly. Some branches of manufacture do not admit of the introduction of such a system; while many others, that are not so conducted, would be benefited by its adoption.

MOLECULAR MOBILITY OF GASES.

In a former volume of the Scientific American particularly on page 234. Vol. VI. (current series) we described the remarkable and valuable discovery of *dialysis*, by Thomas Graham, F. R. S., Master of the Mint, London. He noticed that certain substances possessed the power of diffusing themselves through water with greater facility than others, and he devised the agency of tubular diaphragms, called "dialysers," for the separation of different substances in solution. A new and useful branch of chemical analysis has already been established upon this invention; it has been applied to investigations in cases of poisoning, and for other purposes. Mr Graham has again come before the public with the results of a series of interesting experiments on the "diffusion of gases," in a paper recently read to the Royal Society, and published in the London *Atheneum* The law of the diffusion of gases may be said to run counter to that of gravitation; and every breathing creature is dependent upon it for existence. It may be briefly stated—the gases are of different specific gravity. Thus the specific gravity of oxygen is 100 000; hydrogen (the lightest), 6 2398; carbonic acid 138·219; nitrogen, 88 518. If hydrogen and carbonic acid be placed in a tube, the hydrogen, although it is so much lighter than the carbonic acid, will not float upon the top, like oil upon water; but the heavy gas will ascend and the light gas descend, the two becoming perfectly diffused. How beautifully adapted is this law of gaseous diffusion to the sustenance of life! The atmosphere is composed of 79 parts nitrogen and 21 parts oxygen; or about 1 of the former to 4 of the latter, with a very small quantity of carbonic acid. Were it not for the law of gaseous diffusion, the gases would arrange themselves in the atmosphere according to their densities, and the whole surface of the globe would be covered, first, with carbonic acid several feet in depth; then with oxygen, constituting one-fifth of its amount; and, lastly, above these, a great envelope of nitrogen. In 2401 parts of air, the proportions are:—oxygen 500, nitrogen 1900, carbonic acid 1. As the air is a mechanical mixture, only for this law of gaseous diffusion, no human being could live on the surface of the earth, for carbonic acid is a poison to the lungs; while the breathing of pure oxygen so stimulates the physical system, that animal life can exist but for a very short period under its influence. The proportions of oxygen and nitrogen in the atmosphere are constant—the same in all parts of the world, at all seasons of the year—and their diffusion is so perfect, that no difference can be detected in air at the level of the sea, and that in a balloon, at an elevation of five miles. The notion was once entertained that the gases of the atmosphere arranged themselves like fluids of different specific gravities; and it was held that hydrogen gas, being the lightest, formed the top envelope of all. Dr. Priestley first directed attention to the penetration of gases through porous vessels; but the celebrated John Dalton discovered that light and heavy gases diffused through each other, by a peculiar law belonging to themselves. He filled one bottle with oxygen, another with carbonic acid gas, and connected their necks together by a tube—the oxygen being placed upon the top of the vessel containing the heavy carbonic acid. Contrary to the action of gravity, the heavy gas spontaneously ascended and the light gas descended; and the two soon became so perfectly mixed that the proportions were the same in both bottles. Several years ago Mr. Graham made a most thorough series of experiments in the investigation of this subject, using a glass tube with a porous cap of plaster of Paris, called a *diffusiometer*. through which the gases passed. Recently he found a better substance than the plaster, in artificial graphite, which led him to make a fresh series of experiments. He used his *diffusiometer*, consisting of a glass tube, ten inches in length, half an inch in diameter, and closed at one end with a cemented disk of artificial graphite about the thickness of a wafer. When the tube was filled with hydrogen over a mercurial trough, gaseous diffusion immediately began to take place through the pores of the graphite, the hydrogen passing out and air passing in, through the pores of the graphite, which are so minute that gas in mass cannot penetrate them; for only molecules can flow through, and these are supposed to pass, unimpeded by friction. The sole motive agency appears to be an intestine movement of molecules, which has been recognized as a property of the gaseous condition of matter. A hypothesis has been advanced and received, that a gas consists of solid and perfectly elastic spherical atoms, which move in all directions, and with different degrees of velocity—each gas possessing a special velocity. When confined in a vessel, it is supposed that these atoms are constantly impinging against its sides, and against each other, without any loss of motion, owing to their perfect elasticity. When contained in a glass vessel, like the diffusiometer, with a graphite cap, the gas atoms pass through the pores, by their atomic motion, and the external air or gas passes in by the same force, taking the place of the escaping gas. And this result is effected, whether the gas in the diffusiometer is either heavier or lighter than the air on the outside; only the diffusion is more rapid when the lightest gas is placed in the tube. To this molecular movement the elastic force which gas possesses is due in resisting compression. It is remarkable that when the same gas is present in the inside and the outside of the diffusiometer, the movement of the molecules goes on: they continually enter and leave the tube, without change of volume. What a beautiful and beneficial law is that of molecular movement, or diffusion of gases! By it the poisonous gases emitted from the lungs of living creatures, and given off from the combustion of fires in great cities and villages, as also the exhalations of fermenting matter, are, by self-movement in their atoms, taken up and diffused through the atmosphere, and their places supplied with air capable of sustaining life. How wonderful are the designs of the great Creator of the Universe; upon this simple law of diffusion the existence of all animated nature depends.

WOODY FIBER—VEGETABLE PARCHMENT.

The varieties of woody matter differ in color, texture and hardness. When free from foreign matter, they leave a white translucent residue, which is insoluble in water, alcohol and ether; but convertible, by sulphuric acid, into a substance having some of the characteristics of starch, and also into gum and sugar. It is called in scientific language *cellulose* and linen, cotton, and some other allied substances are nearly pure woody fiber. Weak acids, alkaline liquids and a weak solution of chlorine exert scarcely any action upon it, but when concentrated, they combine with, or decompose it. When clean linen or cotton rags are acted upon by cold sulphuric acid, a magma is formed, which, if immediately saturated by carbonate of baryta or lead, yields insoluble sulphates, and soluble sulpholignites. This magma becomes blue when iodine is added to it; and if it be much diluted and boiled, it yields dextrine and glucose. By the action of sulphuric acid upon paper a useful article, known by the name of vegetable parchment, is obtained. This is prepared by steeping thick unsized paper in a mixture of equal parts of sulphuric acid and water at a temperature of 60° Fah.; then washing it well in cold water and drying. It is translucent, tough and nearly impermeable to water and forms a substitute for vellum. Another method of making it consists in taking two parts, by measure, of the strongest sulphuric acid, with one of water, and soaking white blotting paper in it for a few seconds; then washing it well in water containing a little ammonia. These proportions are important; for if the acid is weaker, the paper will be converted into gum; if stronger, the fiber will be decomposed. When properly executed, the fiber of this vegetable parchment undergoes no chemical change; the molecular condition of the paper is simply altered by the pores being filled up. The paper must be put into the acid dry; for if it is wetted in spots before being put into the acid, the wetted portions will be destroyed.

PENETRATING POWER OF PROJECTILES.

It is stated in some treatises on the penetrating power of projectiles, that this varies as their weight multiplied into the square of their velocities; and the formula, $W V^2 = P$, is employed to express the power. This formula is useful only in comparing projectiles of the same size and form of front, made of the same material; because it is evident that, of two projectiles of the same weight and velocity, but of different diameters, the one of the least diameter will have less resistance to overcome, and will therefore penetrate farthest. In punching iron plates, it is well known that less power is required in punching one inch than in punching two inch holes, and the same law holds good in the case of projectiles. The penetrating power of projectiles should therefore be expressed by the following formula:—

$$\frac{W V^2}{D}$$

W being the weight of the projectile, V the velocity and D the diameter.

The Demand and Supply of Coal.—The demand continues fair for first quality coal, but the second qualities drag a little. This is the dullest season of the year, and it was expected that the trade would be affected to some extent. The stocks in the market are light. Many dealers are buying very sparingly at present, under the impression that the prices of coal will recede. This we do not think will take place; the draft will interfere to some extent with the production, while it progresses. Wages cannot be reduced without a conflict with the men, which would result in the stoppage of the collieries; and even if a slight decline should take place in the price of coal (which we do not believe will be the case under existing circumstances). it will be, more than made up by the increased price of freight as the season advances. We do not believe, therefore, that buyers will gain anything by delaying purchases under the expectation of lower prices. This can only be remedied by an increased supply of labor in the coal regions.—*Miner's Journal.*

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400 UNFORTUNATES.

It is doubtless known to our readers that the government fee for patents is divided into two installments, of which $15 are payable on filing the application, and $20 after the Patent Office has examined the case and decided to allow the patent.

It had become the practice of many applicants to defer the payment of the second fee of $20, for an indefinite period; but in March last, Congress passed a law, requiring the payment of the final fee within six months after the allowance of the patent; all allowed cases then pending were to be regarded as dating with the act, of March 3, 1863. Failure to comply with the law worked the forfeiture of the patent. We gave public notice of the new law at the time, and warned applicants to complete their cases; many did so. But we learn that, on the 3d inst., when the day of grace expired, no less than four hundred applications remained in the Patent Office, with the record fee unpaid; and consequently, by the terms of the law, are forfeited to the public. No patents can issue for them.

The law is mandatory on this point; so it is useless for parties to write to the commissioner, or to bore senators, representatives and other officials, for the purpose of gaining their influence to set aside a plain provision of the statute. It can't be done. The only remedy is to try and have a bill of relief passed by the next Congress. With proper exertion this can probably be effected.

We much doubt the justice of this law, which deprives 400 inventors of their patents. They made their applications under a former enactment, in good faith, and it would seem as if they were entitled to the privileges of the law, as it originally stood. Many of them are in the army, and never knew, and probably do not now know, that the law has been changed. We believe that Commissioner Holloway is desirous that Congress should extend the proper relief; but the peremptory nature of the law as it now reads, prevents him at present from interfering in the matter.

NEW BOOKS AND PUBLICATIONS.

THE TONAL SYSTEM. John W. Nystrom. J. B. Lippincott & Co., Philadelphia.

The object of this work is to set forth the author's views and plans on the subject of a new system for weights, measures, and coins. The question has been agitated chiefly in England and elsewhere abroad, but has not met with much favor in this country, for reasons which we think are obvious. The decimal system, which is so generally adopted here, has, it is true, many disadvantages; but thus far it is the best which has been invented, and any attempt to supplant the well-known Arabic numerals in use, as appears from the author's own showing, would result in endless confusion; witness the following paragraph:—

"The difficulty of introducing the *tonal system* is more apparent than real. Introduce it first into schools, at the same time it will be picked up by one after the other; when a little practice is acquired, they will soon conceive its utility and simplicity, and encourage others to follow. At the same time, the sixteen new figures with their new names and multiplication table to be published in all almanacs and newspapers; the Governments preparing the new standards for weight, measure, and coin; the watch and clock makers making new time-pieces; the mathematicians preparing their tables of logarithms and trigonometrical lines, &c., &c. The astronomers preparing their tables and almanacs for the land and sea and celestial objects; the topographers altering their maps to suit the new division of the globe; the mathematical instrument makers to alter the angle-measuring instruments and thermometers, all to suit the *tonal system*, and it would soon be complete for introduction. All the different units, multiplied and divided by the base 16, could be introduced and employed with the decimal arithmetic to begin with, when in a few years the *tonal* arithmetic would become most natural with its units."

How this would *benefit* the world we cannot exactly see. The system is called Tonal, because instead of 10, as in the decimal plan, it has 16 to the base which it is proposed to term *ton*. The author has his own convictions on the subject; he argues and presents the disadvantages of it very candidly; and we cannot see that he states any reasons for the adoption of his scheme, at all commensurate with the trouble and confusion into which it would plunge those who put it in practice. We cannot refute his arguments one by one, for want of time to study them thoroughly in all their bearings; but the salient points against its introduction are well stated in the author's paragraph quoted above. One thing struck us most forcibly in the Tonal System, and that was the absurdity of the titles by which the new figures are to be called; as, for instance, 129 is called "Sandetonko;" 145, "Sangotonsu;" while 1510,0000 is dignified with the appellation of "Mill-susanton-bong." it is difficult to feel that these names are really intended as a substitute for the sounds representing the value of the figures they are set opposite to; and the teacher instructing his pupil in the Tonal System would have some difficulty in preserving order when the above names were pronounced. Mr. Nystrom is an accomplished mathematician, and has doubtless felt, with many others, the inconveniences attaching to it, but we cannot think the adoption of his plan would avoid the difficulty in the least, but rather add to it tenfold.

THE FOUNDATIONS OF HISTORY; by Samuel B. Schiefelin. Published by Anson F. Randolph, 683 Broadway, New York.

The author of this work declares, in his preface, that the object in publishing it was that the student of history might learn that the Creator had a purpose in view when He made the world, and that the history of it, in connection with divine revelation, is a development of that purpose; also that everything, from the overthrow of empires to the knowledge and ingenuity imparted to man, is only to the advancement of the Christian religion and a more perfect knowledge of the Savior. With this end in view he has collected data from various sources; and, starting from the beginning of all things, gives in proper sequence a great deal of valuable and interesting information on secular subjects, such as relate to the arts and various professions practised in the early days of the world. Among these articles we notice:—First writing, and writing materials; first language; first invention; first artificers; musicians; early knowledge of the arts; first vessel; first heathen philosophers and poets; first money, coins, actors, tragedies; in short, there is a great deal relating to ancient things which renders this book convenient as a work of reference and general reading. There is confessedly a theological tone through the work, as the author intended; and, although the propositions set forth may not be acceded to by all persons, there are few who may not find food for reflection and profitable inquiry between its covers. The book is published in beautiful style, and illustrated by elegant engravings—illuminated and plain. It is a specimen of work of which any publishing house might be proud.

NYSTROM'S MECHANIC'S OR ENGINEER'S POCKET COMPANION. J. B. Lippincott & Co., Philadelphia.

This useful volume is now in the eighth edition, which is a convincing proof of the estimation it is held in by mechanics and professional men. It contains rules, examples, and data, in Algebraic formulæ, for every conceivable mechanical transaction; including also strength of materials, hydraulics, pneumatics, &c. The condensed form of the mathematical expression adopted by the author, admits of the introduction of an immense amount of matter, which is judiciously arranged and selected. Every one requiring the use of such an assistant should procure the work.

THE AMERICAN ILIAD.—Thomas Carlyle, the English satirist, demonstrates to himself that the key to our present war lies in a nutshell, and he proceeds to illustrate it by a pitiful quibble, entirely misrepresenting the character of the struggle. The real nutshells in the American Iliad are the turrets of the Monitors, and the enemies of the Republic find them hard to crack.

A DISTRESSING case of caries of the left tibia and right oscalsis with adherent cicatrices occurred among the Hartford conscripts. The provost marshal wept copiously.

RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week. The claims may be found in the official list:—

Repairing Boiler Tubes.—The tubes and flues of steam boilers and other steam and water apparatus generally give way or leak first at their connection with the tube sheet or near their mouth. My invention consists in the combination of what may be termed a spring gland, composed of a split ring of wrought iron, or other suitable metal, having a cylindrical exterior and conical interior, and a flanged thimble of cast or malleable iron, having a conical exterior, so applied within the mouth of the tube or flue that the thimble expands the glands against the interior of the tube or flue and makes it close the leak. This invention is by Edward Clark, of New York City.

Picking and Burring Cotton, Wool, &c.—This invention consists in the combination of a stationary guard and a revolving guard, arranged above the feed rolls of a picker or burring machine, for the purpose of throwing back on to the feed apron the small pieces and lumps which pass the feed rolls, without being reduced to fiber, and which would otherwise pass round the cylinder and out from the casing with the picked fiber. A patent for this invention was granted to R. D. Nesmith, of Franklin, N. Y.

Steam Engine.—This invention, patented to Tisdale Carpenter, of Providence, R. I., consists in regulating the velo ity of a steam or other engine, by combining the regulator with the induction valves by means of a valve gear which is positively connected with the said valves in such a manner as to be capable of producing, under the control of the regulator, a variable closing movement of the said valves, without detaching or disconnecting them, or any portion of the mechanism of the valve gear, and without the use of any independent power to close the said valves. It also consists in a novel valve gear for producing a positive opening and closing movement of the induction valves, and a variable closing thereof, without detaching or releasing them, composed of a compound cam and rocking levers of variable length, combined either with or without a governor. And it further consists in arranging and operating the eduction or exhaust valves in the cylinder heads parallel with the motion of the piston, by a separate or independent valve movement.

Steering Apparatus.—This invention consists in the arrangement of an internal gear in the drum of a steering apparatus, in combination with the steering wheel and with the tiller or rudder, in such a manner that, by said gear, the transmission of motion from the drum backward to the steering wheel, is rendered impossible, and consequently the sudden jerks of the rudder have no influence on the wheel, and furthermore, the power exerted by the helmsman on the wheel can be multiplied at pleasure; the invention consists also in the arrangement of one or more springs of india-rubber or other suitable material in the interior of the drum of a steering apparatus, and in combination with the internal gear and with the tiller or rudder, in such a manner that the strain on the rope and other parts of the apparatus, caused by the sudden jerks of the rudder, is intercepted by said spring or springs, and damage to the different parts of the apparatus and to the rudder, from this cause, is prevented; the invention consists, finally in the arrangement of two adjustable spring blocks or spring pullies, in combination with the rope and drum of a steering apparatus, in such a manner that, by said spring blocks, a portion of the strain caused by the sudden jerks of the rudder is intercepted, and the rudder is permitted to yield more or less to the force of the waves, without damage to any part of the apparatus. Secured by patents, in the United States and in Europe, through the Scientific American Patent Agency, to the inventor, Julius F. Rochow, of Brooklyn, N. Y.

Band Ruffle.—This invention, by Thomas Robjohn, of New York City, consists in the manufacture of a band ruffle of a single strip of plaited or gathered muslin or other material, which is made to produce both the ruffle or frill and the band, by stitching through the plaits or gathers with two rows of stitching, one of which is also made to secure an edge of the material which is turned in to give a finish to the edge of the band.

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Patent Claims

ISSUED FROM THE UNITED STATES PATENT-OFFICE

FOR THE WEEK ENDING SEPTEMBER 1, 1863.

Reported Officially for the Scientific American.

*** Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

39,709.—Condenser.—B. T. Babbitt, New York City :

I claim the arrangement of the two chambers, D D′, in opposite corners of the casing, A B C, and of the two series of bent or elbow pipes connecting the said chambers in the other opposite corners, substantially as and for the purpose herein described.

39,710.—Inhaler.—Gottlob Bastian and Bernhard Segnitz, New York City :

We claim, first, The arrangement of the globe valve, D, in the bottom of the tube, A, and between the medicine chamber, C, and mouth-piece, B, in the manner and for the purpose substantially as herein specified.

Second, The spring lever valve, E, in combination with the tube, A, and medicine chamber, C, as and for the purpose set forth.

[This invention consists in the arrangement of a globe valve between the medicine chamber and the tube which leads to the mouth-piece of the inhaler, in such a manner that the nitrogen and carbonic acid gas expelled by the expiration is prevented from coming in contact with the medicine ; the invention consists also in the attachment of a spring lever valve to the side of the inhaling tube, between the globe valve in its bottom and the mouth-piece in its top, in such a manner that by a pressure of the finger on the lever, said valve can be thrown wide open, and by thus providing a free exhaust, the expiration is rendered easier than it is with inhalers of the ordinary construction.]

39,711.—Stave-dressing Machine.—L. D. Benson, L. C. Benson and A. M. Benson, North Jackson, Pa. :

We claim the placing of the cutters, O, and pressure rollers, N, in adjustable frames, M, when said frames are used in combination with the feed bars, G G, operated substantially in the manner as and for the purpose herein set forth.

[This invention relates to a new and improved machine for dressing staves, and consists in a novel and improved arrangement of guide rollers and cutters, whereby the rollers and cutters are enabled to adjust themselves to the form of the staves while they are being cut, and the machine thereby made to operate with a moderate expenditure of power, and to perform better work than hitherto.]

39,712.—Potato Digger.—Charles Blood, Malta, N. Y. Ante-dated Aug. 25, 1862 :

I claim the arrangement of a fixed horizontal share, E, together with an endless apron or elevator, G, and riddle, L, behind the truck wheels, B B, said truck wheels also communicating the necessary movements to the elevator and riddle, all as and for the purpose herein specified.

I also claim the combination of the elevator roller, g, having transverse or alternately acting cam grooves, h h, in the ends thereof, with the arms, d d, projecting from the riddle, L, as and for the purpose herein set forth.

39,713.—Inner Sole.—Daniel Bowker, Boston, Mass. :

As an improved article of manufacture I claim the inner sole of boots and shoes, constructed in manner and for the purpose as above described.

39,714.—Picker for Looms.—John Cady, Staffordville, Conn. :

I claim the clasp, B, clamp, C, and leathers, D, in combination with the staff, A, for the purpose as described.

39,715.—Steam Engine.—F. A. Calvert, Lowell, Mass. :

I claim the combination of the auxiliary piston and its operative mechanism with the primary piston and the cylinder made as described, and provided with a steam chest, a valve, and a valve apparatus, to operate substantially as and for the purpose specified.

I claim, in combination with the steam chest and the cylinder, made with eduction or exhaust openings arranged in it, as described, a means substantially as explained, for cushioning the piston and introducing the over-pressed cushioning steam into the steam chest.

I claim the combination of the vapor chamber or hot well, I, the cylinder, its steam chest, valve, and valve apparatus, the primary and auxiliary pistons, and the mechanism for elevating and depressing the auxiliary piston, the whole being constructed and arranged, substantially in manner and so as to operate together, as specified.

I claim the combination of one or more induction passages and their valve or valves with the cylinder, the main and auxiliary pistons, and as applied to the head of the cylinder and to that of the auxiliary piston, substantially as and for the purpose or purposes above specified.

39,716.—Conveyer's Belting.—John Campbell, St. Louis, Mo. :

I claim the use of the hemp belting before described, made substantially as herein represented and set forth, as a new article of manufacture, for the purpose specified.

39,717.—Device for repairing Boiler Tubes.—Edward Clark, New York City :

I claim the spring gland, C, and thimble, D, constructed and applied in combination with each other and with the tube or flue, A, substantially as herein specified.

39,718.—Weather Strip.—J. O. Clay, Hudson, Wis. :

I claim, first, The construction of boxes, C, with their cam-shaped eye or socket, a, in combination with the flat projecting ends, x x, of the adjusting strip, B, to operate substantially in the manner and for the purposes described.

Second, I claim the construction of the eye of the boxes, C, with the one eccentrically curved edge to serve as a cam-wedge to hold the edge of the weather-strip close down upon the sill, in the manner and for the purpose described.

Third, The arrangement of the adjusting strip, B, angularly in relation to the door jambs, sill and carbet strip, for the purpose of causing the joints between the overlapping strips, and between the adjusting strip and sill, to be firmly and tightly closed, in the manner substantially as described.

Fourth, I claim the use and arrangement of the ring or disk-formed tappet, in the manner and for the purpose set forth.

39,719.—Harvester.—I. H. Coller, Poughkeepsie, N. Y. :

I claim the manner of attaching the head, A, to the knife rod, B, by means of the double dovetails, a a, and rivets, b b, or their equivalents, substantially as described.

39,720.—Barrel Hoop.—John B. Dougherty, Rochester, N. Y. :

I claim my process of producing barrel hoops by cutting them from a block in which the locks are already formed, so as to secure greater accuracy in the shape and size of the hoops, as well as greater strength.

Second, I claim my method of forming the splint thus produced into a hoop, by winding it after being steamed on to a proper former.

39,721.—Tent.—Nelson Cross, New York City :

I claim the construction of an adjustable wall tent frame with more or less angular sides, conical roof and eaves brackets wholly composed of straight pieces of wood, the body of which is joined together in a lattice form and made capable of extension for occupancy, or depression for transportation, without altering or disturbing the fastenings, whilst it also affords, between the diamond openings of the frame, when extended, an ample and convenient entrance way.

I also claim the combination of the several parts of the frame and the form and mode of attaching and distending the cover, as heretofore described, as and for the purposes aforesaid.

39,722.—Grain Dryer.—W. H. Dole and D. R. Fraser, Chicago, Ill. :

First, We claim the inner and outer cylinders, E and F, in combination with the radial flanches, a and b, arranged within the space between said cylinders, and operating substantially as herein described.

Second, A drying cylinder so constructed that while the grain is kept near its circumference, the grain is tossed back and forth outside of the center of the machine toward and from the center in a waved line, as indicated by the arrows, 2 2, and at the same time subjected to heated air, substantially as described.

Third, The combination of the scoop extensions, a′ a′, and flat flanches, b b, the scoop portions working in the chamber between the ends of the cylinders, E F, substantially in the manner and for the purpose described.

39,723.—Stop-motion for Looms.—George Draper, Milford, Mass. :

I claim the application and construction of the frog and its supports, in such manner as not only to cause the frog to rise, but to be stopped in its rise under impact or operation of the dagger, the whole being substantially as and for the purpose as herein before described.

39,724.—Cultivator.—G. A. Erickson, Sweed Bend, Iowa :

I claim the described combination of a vibrating harrow, E, with a cultivator ; the whole being constructed and arranged to operate in the manner and for the purpose herein specified.

[In this invention a laterally vibrating rake is applied to a harrow or cultivator of any suitable construction, its effect being to pulverize the soil in a very efficient manner.]

39,725.—Gas Burner.—J. S. Fancher, Newark, N. J. Ante-dated Oct. 11, 1862 :

I claim the expanding of the gas as it issues from other gas burners, or from any orifice through which the gas is emitted, before it comes in contact with the atmosphere, so as to be ignited by means of two fans or planes, represented in my drawings by figures 3 and 4; these planes may be of any shape or form.

Also the application of the principle of regulating the flame by means of the screw, represented in the drawings by figure 5, with which the fans or planes are separated or brought together, thus adjusting the light as may be desired.

And also the use of the screw for opening the fans for the purpose of cleaning the burner.

39,726.—Step-ladder.—Vincent Fountain, Jr., Factoryville, N. Y. :

I claim, first, The converting the step-ladder which is used as a prop into a continuous and extension ladder, as described, by turning the same upward vertically, upon the pin or bolt, as described.

Second, I claim the manner of constructing the platform, c′ c′, with a leaf and hinge, so as to be used as a platform for the step-ladder, or turned over out of the way, to permit the extension part, B, to be brought into its proper position for forming an extension ladder.

39,727.—Smoke-stack.—H. R. Gillingham, Jersey City, N. J. :

First, I claim, in the locomotive, providing for the checking or extinguishment of fire, by the exhaust steam, by discharging it backward through the furnace, substantially in the manner herein set forth.

Second, I claim the lever, J, link bar, K, and stop, b, or their respective equivalents, arranged as described, on one or more sides of the duplicate movable internal pipes, E and I, of a smoke stack, for the purpose herein set forth.

Third, I claim, in the stacks of locomotives, the use of the shields, m m, arranged as described, relatively to the holes, M M, for the purpose herein set forth.

Third, I claim in the stacks of locomotives the use of the shields, m m, arranged as described relatively to the holes, M M, for the purpose herein set forth.

39,728.—Pump.—A. G. Gray, London, England. Ante-dated March 11, 1863 :

I claim, first, The combination of the peculiarly constructed driving cam, with the right-angular lever arms, s, arranged and operating a pump, substantially as described.

Second, The use of a weight or its equivalent, either adjustable or not, so arranged in regard to and operating with the lever arm, s, as to counteract the tendency of the piston rod to be drawn back by the formation of a vacuum in the pump, substantially as described.

39,729.—Beehive.—Wellington Green, Kinzua, Pa. :

I claim a house or structure, A, provided with drawers, D, fitted within it, as shown, and provided with a perforated bottom, b, alighting boards, B B′, and perforated slides, C C′, all arranged and combined to form a new and improved bee-house or beehive, substantially as set forth.

[The object of this invention is to obtain a beehive which will admit of thorough ventilation, and at the same time be proof against the invasion of the moth, and admit of drawers being placed in the hive or structure and removed therefrom with the greatest facility, and also admit of a communication being formed or cut off between the drawers, as occasion may require.]

39,730.—Mop Head.—J. S. Harris, Poultney, Vt. Ante-dated Dec. 17, 1862 :

I claim the arrangement of the levers, C C, in connection with the pressure plate, B, and of the frame, A, operating in the manner and for the purpose specified.

39,731.—Cider Mill.—S. A. Hebard, North Stamford, Conn. :

I claim, first, The combination of the grinding or reducing cylinder, with the adjustable blade or bar, when constructed to operate substantially as and for the purpose set forth.

Second, The combination of the roller, g, with the brush cylinder, when the said roller and brush cylinder are arranged relatively to each other, and operate substantially as described.

39,732.—Horse Hayfork.—B. F. Hisert, Norton Hill, N.Y.:

I claim the securing of the tines, E, to the head, A, of the fork by having the inner ends or parts of the tines curved so as to extend wholly or partially around the head, and having eyes or sockets, a′, fitted on the tines and secured to the head by bolts, F, either attached to or formed with the eyes or sockets or made separately therefrom, and passing through the eyes or sockets and through the head, A, and the tines, substantially as described.

[This invention relates to a new and improved mode of securing or attaching the tines of the fork to the head of the same, whereby a very strong and durable fork is obtained, with less weight than usual.]

39,733.—Remedial Applications of Electricity.—Mark W. House, Cleveland, Ohio :

I claim, first, The arrangement of two helices of the same or different intensities upon the same stand, and so connecting them that a primary interrupted or uninterrupted current, and an induced current may be given at the same time, as specified.

Second, I claim closing the circuit of the induced current, in the manner substantially as specified and shown at Q and Q′, while the primary current is being used, for the purpose of increasing the intensity of the primary or giving the reflex action of the induced to that of the primary current.

Third, I claim the pole changers when placed in the circuit at any point between the helix and the electrodes, and operating as and for the purpose specified.

Fourth, I claim the current directors, for the purpose of conveniently localizing the currents, substantially as and for the purpose herein set forth.

39,734.—Tug Buckle.—N. H. Howard, Beloit, Wis.:

I claim the lever, as above specified, as applied to and in combination with the roller or bar and the rise and swell in the tug, as above represented.

39,735.—Grinding Mill.—Benjamin Kenoyer, Edina, Mo. :

I claim connecting the drivers, P R, to the stones, O Q, by providing the former with arms, g l, with india-rubber strips, j n, interposed between them and the stones, and having screws, k m, pass through the stones, rubber strips, and arms, substantially as herein described.

[This invention consists in a novel and improved arrangement of the upper and lower stones of a grinding mill, whereby both stones are rendered capable of being adjusted laterally, so as to insure at all times the parallelism of the two stones. The stones also being provided with drivers arranged or applied in such a manner as to admit of the stones being adjusted at any time, when required to keep them at right angles with their spindles.]

39,736.—Attaching Breeching to Thills of Vehicles.—La Roy N. Leslie and Thurston Richardson, Leominster, Mass. Ante-dated Nov. 19, 1862 :

We claim, first, constructing a breeching hook with a spring lever placed in or at its opening, and turning upon a pivot or fulcrum, so as to operate substantially as hereinabove described.

We also claim constructing the spring lever with right-angular arms, working close or nearly close up to the bow of the breeching hook, substantially as described and for the purposes specified.

39,737.—Sash Fastening.—W. S. Mallory, Batavia, N. Y.:

I claim the described arrangement of the lever, b, fulcrum, o, knobs, d and e, in combination with the cam shaped hook or fastener, all arranged substantially in the manner and for the purpose set forth.

39,738.—Duck's-foot Propeller.—George Meader, Ottawa, Ill. :

I claim the combination of the movable stops, C C, the slots, f f, in the paddles, the rod, D, and the spring, e, or its equivalent, substantially as herein specified.

[This invention consists in certain means of reversing the action of a duck's-foot propeller, for the purpose of backing or turning the vessel to which it is applied, without reversing or stopping the engine.]

39,739.—Mash Tub.—Amos Miller and J. R. Stauffer, Pennsville, Pa. :

We claim the arrangement of a perforated pipe, F, with four arms, b, in the bottom of a mash tub, constructed and operating in the manner and for the purpose shown and described.

[This invention relates to an improvement in that class of mash tubs in which steam is used for the purpose of heating the mash, and the object of the same is to simplify the construction of the tub and arrange the same so that the steam is equally distributed throughout the mash, and at the same time no chance is left for the accumulation of verdigris, whereby the fermentation is impaired.]

39,740.—Arithmetical Calculator.—J. P. Miller, Boston, Mass. :

I claim an instructing apparatus or frame, made with registering and denoting bars and boxes, in the manner and for the purpose substantially as herein set forth.

39,741.—Plow.—Henry Mitchell, Racine, Wis. :

I claim the combination of the curved bar, D, constructed as shown, and the brace, f, with the landside, C, formed as shown, standard, B, share, D′, mold-board, E, handles, F F, and beam, A, all in the manner herein described.

39,742.—Machine for Burring and picking Wool, Cotton, &c.—R. D. Nesmith, Franklin, N. H. :

I claim the revolving guard applied to operate in combination with the stationary guard and in relation to the main cylinder, in the manner and for the purpose substantially as herein specified.

39,743.—Gang Plow.—J. S. Padon, Lebanon, Ill. Ante-dated March, 1, 1863 :

I claim, first, the combination of the movable frames, consisting of the sills, R R, with the main frame, when they are arranged on said frame, as described, and when said frame is mounted on truck wheels, as described.

Second, The combination of the movable and adjustable plow beams, D, with the sills, R, when said beams are made to operate in connection with said sills, substantially as described.

39,744.—Stump Extractor.—L. P. Pease, McCordsville, Ind. :

I claim, first, Transmitting motion from the sweep, M, to the windlass shaft, K, through the medium of a crank, F, and toggle, H, combined and operating in the manner and for the purposes set forth.

Second, The combination of the toggle, H, arm, X, feed hand, I, ratchet wheels, J O, windlass shaft, K, and detent pawl, N, constructed, arranged, and operating in the manner and for the purposes set forth.

Third, The rear axle, Q, hinged at its upper edge to the main frame, in the described combination, with rods, S, bell crank levers, R, and bolster, T, for raising the machine upon its wheels.

Fourth, The combination of the pulley, V, and cord, U, with the axle, Q, and rods, S, for elevating the machine by a partial revolution of the sweep.

[In this machine a peculiar combination of toggle and cranks is employed to exert a powerful drawing force upon the stump. The invention is also provided with a device by which it may be elevated upon its wheels by the force of the team, when it is removed from place to place.]

39,745.—Hoisting Apparatus.—Harman Pennepacker, Kimberton, Pa.:

I claim the arrangement of the standards, a a, in the truck frame, A, forming bearings on the outside of the hub of the wheels, B B, in combination with the shaft, e, and gear, f g h i, all constructed and operating in the manner and for the purpose herein shown and described.

[The object of this invention is to produce a simple device for the purpose of raising rocks or other heavy articles, and hauling them from one place to another.]

39,746.—Composition for Explosive Shells.—Jonathan P. Perry, Foxborough, Mass. Ante-dated Sept. 19, 1862:

I claim a liquid shell mixture as made of powdered sulphur and an explosive liquid or composition of alcohol and turpentine.

I also claim the combination as described of cotton or a like material, or a series of bullets or balls with the sulphur, when combined with an explosive liquid (composed of alcohol and spirits of turpentine), and used in a shell provided with a bursting charge as explained.

39,747.—Machine for planing Shavings for Upholsterers.—S. A. & W. H. Post, Durham, N. Y.:

We claim the combination of the toothed cutter, C, with the planer, F, the above parts being fitted in a sliding or reciprocating bed, B, and used in connection with a stop, I, and lever or clamp, K, or their equivalents; all arranged substantially as and for the purpose specified.

[This invention consists in the employment or use of a toothed cutter placed at right angles in a reciprocating bed, in connection with a planer fitted obliquely in the same bed ; the latter being placed on a suitable framing provided with a lever or clamp and a stop, and all arranged in such a manner as to effect the desired end.]

39,748.—Baling Press.—Jacob Price, Jr., Petaluma, Cal.:

I claim, first, The combination and arrangement of the levers, N N, chains, L′ L′ P P, pulleys, M M, and shaft, R, provided with the heads, Q Q, substantially as and for the purpose herein set forth.

Second, The inclined surfaces, a* b*, at the inner sides of the doors, D D, and sides of the press box, A, as and for the purpose specified.

Third, The fastenings formed of the spring-catch, E, for holding the doors, D, in an open state, and the fastenings formed of the

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curved bars, E′, and lever, G, for securing said doors in a closed state as described.

[This invention consists, first, in a novel and improved construction of the press-box, whereby the bale may be readily discharged from the press-box; Second, in an improved fastening for the doors of the press-box to keep them in an open and closed state. Third, in a novel and improved means for operating the follower, whereby speed is obtained at first, when great power is not required, and speed dispensed with and power obtained when the latter is not required.]

39,749.—Cross-cut Sawing Machine.—J. H. Rauch, Ida, Mich.:

I claim the two frames, A A′, one, A, provided with a bent lever, B, having its inner part of tubular form and slotted longitudinally, and the other one, A′, provided with an adjustable spring, C, and each frame provided with a spring, F, and guides, E E, in combination with the saw, D, provided at its ends with a reversible rod, h, and bar, i, all arranged for joint operation as and for the purpose specified.

[This invention relates to a new and improved cross-cut sawing machine, for sawing logs into fire-wood, and also for sawing down standing trees; the invention consists in a novel arrangement of a saw with a lever, springs and a framing, whereby the saw may be readily applied to its work and operated by a single individual.]

39,750.—Heater.—John S. Reid, Muncie, Ind.:

I claim the combination of the oblique pipes, C, connecting chambers, D D′, and nozzles, E E′, when the said parts are constructed, arranged, and connected as herein described, to constitute a new and complete article of manufacture, adapted and employed for use within and obliquely across the chimney, B, as specified.

39,751.—Crutch.—David Ring, Damariscotta, Maine:

I claim the combination of the rest hook, rod, spring and tube, after the manner and for the purpose herein specified.

39,752.—Steering Apparatus.—Julius Ferdinand Rochow, Brooklyn, N. Y.:

I claim, first, The arrangement in combination with a steering apparatus, of a differential gear substantially such as herein described, to operate in combination with the steering wheel and tiller or rudder, in the manner and for the purposes set forth.

Second, The arrangement of a spring or springs in the interior of the drum, substantially as specified, in combination with the internal gear and with the tiller or rudder constructed and operating in the manner and for the purposes as described.

Third, The arrangement of the adjustable spring block, H, in combination with the drum, A, rope, G, and tiller, I, constructed and operating as and for the purpose set forth.

39,753.—Whiffle-tree.—Reuben Rolph, Coventry, N. Y. Ante-dated Oct. 26, 1861:

I claim the pivoted bars or rods, E E, in connection with the shaft, E, provided with the cams, h h, the above parts being applied to the whiffle-tree, B, and arranged with suitable springs, substantially as shown for the purpose set forth.

I further claim the employment or use of the straps, G H, when attached to the whiffle-tree, B, and arranged relatively with the crank, i, of the shaft, F, as shown, for the purpose specified.

[This invention relates to a novel and improved means employed for detaching simultaneously the two traces from the whiffle-tree, so as to readily detach the horse from the vehicle, in case of the animal running away or when restive or unmanageable, as well as to expedite the detaching of the horse from the vehicle in ordinary cases of unharnessing.]

39,754.—Ink-well.—Joseph W. Ross, Boston, Mass.:

I claim, first, Forming a "float" for liquids, by combining cork or other buoyant material with a protective covering of rubber or guttapercha, substantially as described.

Second, The combination of the screw-socket, d, tube or well, i, and top plate, k, arranged together substantially as described and for the purposes specified.

39,755.—Engine Turning Machine.—Anton Schwitter, New York City:

I claim the employment or use of adjustable blocks or guides, i i′ i″, in combination with the rosette, E, of an engine turning machine, constructed and operating substantially as and for the purpose set forth.

[This invention consists in the employment or use of movable blocks or guides of different shape, in combination with the rosette of an engine turning machine, in such a manner that by combining said blocks in various ways, different lines and configurations can be produced on the article intended to be ornamented by the engine-turning machine.]

39,756.—Oscillating Engine.—Hermann Shlarbaum, New York City:

I claim the peculiar arrangement for distributing steam to and from the opposite sides of the piston, H, in double-acting, oscillating high-pressure steam engines, which is effected on two straight and steel-lined surfaces, D and E, which are at right angles, both in the horizontal and in the vertical planes to the axis of oscillation, B, and are opposite each other; with two steam conducting head-pieces, M and N, on the ends of the steam and exhaust pipes, I and K, those head-pieces being pressed against the cylinder, A, by means of the screws, O; the changes of steam to be made by the movement of the cylinder, A, alone, without any movement of the steam conducting head-pieces, D E I K, and without any steam passing through the axis of oscillation or trunnions, B, of cylinder, A, all in the manner heretofore described.

39,757.—Machine for Cutting and Punching Iron.—Andrew Shogren, Mission, Ill.:

I claim, first, The prime lever, C, when constructed with two parallel bars, so as to be open nearly its entire length and hinged at the outer end to a bed similarly constructed.

Second, The combination of the bed, B, prime lever, C, hand lever, D, and its connecting bars, H H, with the standard, A, and shears, F, or punch, G, all being substantially as set forth and specified.

39,758.—Burial Case.—Edwin A. Skeele, St. Louis, Mo.:

I claim, first, The within described arrangement and combination of the reservoir, m k, escape passage, p, and perforated screw, h n, the same being constructed and arranged relatively, substantially as herein described for the purposes set forth.

Second, In combination with the said devices, m k p h n, I claim the receptacle, d, constructed and arranged substantially as and for the purposes specified.

39,759.—Power Loom for Weaving Tufted Pile Fabrics.—Halcyon Skinner (assignor to Alexander Smith), West Farms, N. Y.:

I claim the manner of mounting and operating the several warps, relatively to each other, and to the introduction of the tufts, and the series of wefts, substantially as described, and for the purpose set forth.

I also claim the improved arrangement herein described for transferring the spool frames which carry the tufting yarns, as distinguished from the arrangement described in the before recited patents, for effecting the transfer.

I also claim the mechanism herein described for performing the combing operation on the tufts.

And I also claim the said combing mechanism in combination with the mechanism for holding the tufting warps in the same plane during the tufting operation, as described.

I also claim the mechanism, substantially as herein described, for cutting off the tufts by means of a single pair of shears, as distinguished from a pair of shears for each tuft, as described in the before recited Letters Patent.

And I also claim the manner in which the plate, which beats up the tufts, is prevented from chafing the warp threads, substantially as described;

39,760.—Cultivator.—H. B. Smith, Eureka, Ill.:

I claim, first, The pivoting of the plow handles, N N, to rods, M, fitted vertically and loosely in shafts, L, which are allowed to turn in their bearings in pendants, g′, attached to a shaft, f, which is also allowed to turn in its bearings, all being arranged as shown to admit of the adjustment of the plows, O, as and for the purpose set forth.

Second, The plows, J, and rake share, E, attached to separate or independent shafts, H H C, which are fitted loosely between pendants, d, connected to a shaft, B, that turns loosely in its bearings in the frame, A, of the machine, as and for the purpose set forth.

Third, In combination with the plows, O O J J, and rake share, E, arranged as shown, the adjusting chains, F G K, and A′ P, applied in the manner as and for the purpose specified.

[The object of this invention is to obtain a machine which may be conveniently adapted for all the various kinds of work required for the cultivation of crops grown in hills or dells, such, for example, as the earthing up of the growing plants, and the removal of earth therefrom, the pulverizing of the soil between the rows, and the thorough eradication of weeds, as well as the furrowing of the ground preparatory to planting the seed, and the digging up of roots, such as potatoes and the like.]

39,761.—Plow.—Nathaniel S. Tallmadge, Fond du Lac, Wis. Ante-dated Oct. 24, 1862:

I claim the arrangement of the braces, a a′ c c, the braces, e e′, the rib marked, r, and the land side constructed as described and for the purposes substantially as set forth.

39,762.—Window Spring and Fastener.—George W. Tilestón, New Haven, Conn.:

I claim the lever, B, and latch, E, when the same are pivoted together and combined with the spring, S, substantially in the manner and for the purpose specified.

I claim the manner described of attaching the pad, c, to the lever.

39,763.—Shoe-maker's Bench.—Jonas Tramblie, Janesville, Wis.:

I claim, first, The substantial construction of the bench, when combined with the pegging and crimping jacks as shown and described.

Second, The pegging jack, when constructed substantially as set forth, having an adjustable standard, G, operated upon to give it any desired angle by the thumb-screw, a, or any desired extension by means of the screw on standard, G, combined with the friction spring, h, and conical joint shown at Fig. 1, and the friction journal caps, L, when arranged substantially as herein set forth and described.

Third, The crimping jack, when arranged to revolve in the various ways, and in the manner herein described and set forth.

39,764.—Flax Harvester.—S. W. Tyler, Greenwich, N. Y. Ante-dated Sept. 27, 1862:

I claim, first, The employment or use of reciprocating jaws applied to a rotating shaft, and arranged to open and close at proper intervals, so as to grasp the standing flax and eradicate it or pull it up from the earth and deposit it in layers at the back of the machine, substantially as set forth.

Second, The employment or use of the reciprocating jaws in combination with a depositing platform or receptacle, when arranged on a mounted frame and operated automatically, so as to grasp and pull up the standing flax and discharge the same at the proper time upon the platform or receptacle, and this I claim irrespective of any pulling or eradicating movement which may be given the jaws, so long as the latter are made to pull up and discharge the flax automatically, or by the draught movement of the machine.

Third, In combination with the reciprocating jaws, guards or fingers, arranged either separately from the jaws, or combined therewith in such a manner as to divide or separate the standing flax into masses or parcels to be grasped by the jaws, substantially as described.

Fourth, The employment or use of the supporting bars, U, when placed in relation with the reciprocating jaws and fingers to support the pulled flax and keep it in proper position until it is discharged from the jaws.

Fifth, The combination and arrangement of the slides, I K N, and elastic levers, O, operated through the medium of the cam, V, and spring, S, or their equivalents as set forth.

Sixth, The ratchet pinion, H′, constructed substantially as shown, when used in connection with the reciprocating jaws, applied to a rotating shaft for the purpose of allowing the jaws to complete their throw when the draught movement of the machine is stopped.

Seventh, Providing the reciprocating jaws with cushions or elastic coverings, d′, at their face sides, substantially as and for the purpose set forth.

Eighth, The wheel, D, attached to the bar, v, of frame, E, or other suitable support, when said wheel is arranged relatively with the fingers or guards, H, and jaws, J L, for the purpose specified. I also claim combining the slides, g and I, with feathered guides, e, substantially as described.

39,765.—Ruffle Iron.—Nathaniel Waterman, Boston, Mass.:

I claim the improved ruffle iron made substantially as described.

39,766.—Baby Tender.—Asahel Wheeler, Newton, Mass.:

I claim the elongated and concave shield or supporter, provided with straps for securing it to the arm, substantially as herein described and for the purpose specified.

39,767.—Cotton Gin.—Israel F. Brown, New London, Conn., assignor to Mary Jane Brown, F. H. Lummus & Jeremiah Johnson, Brooklyn, N. Y.:

I claim constructing the doffer of plates of metal or equivalent material, arranged and operating substantially in the manner set forth.

39,768.—Machine for Stamping and Drilling.—Joseph W. Fowle (assignor to William H. Osgood), Boston, Mass. Ante-dated July 15, 1863:

I claim, first, To construct a clamp, consisting of the two clamp levers, G G′, which interlock each other; the fork, k k′, fitted into G G′, the wedges, m m′, for adjustment, as above explained and exemplified by Figs. 3, 4, 5, and 6.

Second, To use a stamp or drill rod, N, in combination with the clamp levers, G G′, smooth, or cut with annular or spiral grooves.

Third, To give a turning motion to the stamp or drill rod, in combination with collar, P, friction pawl, Q, spring, O, connecting rod, T, and swivel pin, W.

Fourth, To stop and start the working of the stamp or drill rod and parts connected with it, by means of clasps, A′ A″, levers, U U, spindle, V, crank, w, pitman, x, stud, y, pin, z, and hand lever, B′, as specified above.

39,769.—Car Spring.—Charles D. Gibson (assignor to Charles S. S. Lenox), New York City:

I claim, first, Combining any suitable elastic packings or auxiliary springs, C C, with the ends of rectilineal, or curved metallic springs, A′ A, substantially in the manner and for the purpose herein set forth.

Second, Combining the retaining caps, B B, with the ends of metallic spring plates, by means of hinged or pivoted joints, substantially in the manner and for the purpose herein described.

Third, Pivoting or hinging the central bearings of metallic plate springs, substantially in the manner, and for the purpose herein set forth.

Fourth, I also claim the use and combination of an auxiliary bearing spring, F, of india-rubber (or its equivalent), with a metallic plate spring, when arranged substantially in the manner and for the purpose herein set forth.

39,770.—Door Lock and Latch.—Edward Halley (assignor to Patrick Kennedy), Branford, Conn.:

I claim the combination of the horse shoe and latch bolt when the same are constructed in the manner described, so as to allow a partial withdrawal of the latch-bolt, independent of the horse shoe, for the purpose specified.

39,771.—Revolving Fire-arm.—Charles W. Harris (assignor to James M. Cooper), Pittsburgh, Pa.:

I claim the use, in combination with the positive locking bolt, in revolving fire-arms susceptible of operation by the trigger, of a vibrating pawl at the forward end of the trigger, for the purpose of operating the locking bolt, so that, as the trigger is released after the pistol has been fired and is regaining its position for repeated action, the extremity of the vibrating pawl will recede, passing under the locking bolt, and thereby engaging it again, so that, when the trigger is pulled, in firing the pistol, it will immediately draw down the head of the locking bolt, out of its recess in the charge cylinder, and so hold it until the hammer is at half-cock, when the vibrating pawl releases the bolt, and allows it to react against the face of the charge cylinder, ready to drop into the notch in the cylinder, as soon as the cylinder is sufficiently turned, substantially as herein before described.

I also claim the use of a "cut-off" consisting of a spring bolt, or other suitable device, which may be operated from outside of the lock frame, for holding the cock pawl of the trigger off from the toe of the hammer, so that it cannot engage the cock-notch in the hammer; and thus, at will, preventing the hammer being raised by the trigger, whenever it is desired to have the pistol operate exclusively as a hammer-cocking arm.

I also claim lowering the toe of the hammer, so that, when in position in the lock frame, before the piece is fired, the toe of the hammer will not be in contact with the rear end of the trigger, and thereby giving a slight play to the hammer and permitting of its being raised slightly without drawing back the trigger; in order that the trigger may regain its proper position after firing, even though the hammer should have been prevented from falling completely, by a piece of escaped cap or other obstruction, substantially as hereinbefore described.

39,772.—Steam Trap.—John W. Hoard and George B. Wiggin (assignors to Phineas D. Wesson), Providence, R. I.:

We claim the combination and arrangement of a closed tube, f, within the steam pipe, with a diaphragm, I, and a valve, m, substantially as herein described, for the purpose specified.

39,773.—Roll for Horse-shoe Blanks.—John W. Kingsbury (assignor to himself and L. M. Kollock), New Bedford, Mass.:

I claim the dies, C C, fitted to taper dovetail grooves in the detachable collar, B, and conforming to the exterior of that portion of the roll which receives the said collar, and thereby obtaining a bearing directly upon the roll itself, substantially as herein described.

[This invention consists in a novel, very simple and secure method of attaching creasing, or other dies, to rolling mill rolls, whereby, in case of the breakage or injury of one of the dies, it may be replaced at less expense than when attached in the usual way.

39,774.—Smut Machine.—R. M. Phenix, Black River Falls, Wis., administrator of the estate of R. P. Phenix, deceased:

I claim the combination of the grain separator, H, fans, C S, suction spouts, k l k′ l′, blast spout, R, the scouring device and the chess box, M, all arranged to operate as and for the purpose set forth.

[This invention consists in a novel and improved arrangement of suction blast spouts, two fans, a separator and a scouring device, whereby oats, cockle and impurities may be separated from wheat, and the latter, in its passage through the machine, cleaned from smut dirt and all other foreign substances.]

39,775.—Machine for Stripping File Blanks.—Albert Marshall of Lawrence, Mass., and A. B. Southwick, of Ballardvale, Mass., assignor to The Whipple File Manufacturing Company, of said Ballardvale, Mass.:

We claim the machine, substantially herein described, for stripping file blanks, consisting essentially of the mechanism for holding and vibrating the file bank, or its equivalent, in combination with the mechanism for holding and vibrating the files, g, or its equivalent, operating in the manner substantially as herein set forth.

39,776.—Carding Engine.—W. K. Platt, Philadelphia, Pa., assignor to himself, and George S. Harwood and George H. Quincy, of Boston, Mass.:

I claim the combination of the electrical attraction bar and its conductor, or the equivalent or equivalents thereof, with a carding engine, the same being substantially as and for the purpose specified.

39,777.—Folding Tent Frame.—Richard B. Pullan (assignor to Jessie D. Pullan), Cumminsville, Ohio:

I claim the arrangement and combination of the ring, a, and bars, g, with the cords, c and e, for stretching and otherwise operating the inner and outer coverings of the tent, as herein described and represented.

39,778.—Machine for making Horse-shoes.—Andrew J. Roberts, Boston, Mass., assignor to Benjamin F. Brown, Dorchester, Mass.:

I claim, firstly, Operating the various mechanical devices employed in machines for making horse-shoes by means of the vertical or up-and-down movement of a heavy drop hammer.

Secondly, Bending the "points" of the shoe to form the "calks," by means of the lip projection, g′, upon the under surface of the drop weight, arranged and operating substantially as set forth.

Thirdly, The arrangement of the vertical cam lever, u, sliding plate, s, and arms, p p, attached to the arms, d d, of the formers, e e, in combination with the drop-weight, the whole operating together in the manner described and for the purposes set forth.

Fourthly, Is the use of the beveled piece, q′, attached to the sliding formers and benders, e e, and beveled piece, p′, upon o′ o′ rest, the two being so arranged with regard to each other as to raise or lower the said punches, substantially in the manner and for the purpose described.

Fifthly, Disconnecting the devices employed for raising the drop-weight, by means of the vertical rod, A, spring-lever catch, y′, and vertical swinging lever, w′, that forms the bearing for one end of the driving shaft, arranged and operating as set forth.

Sixthly, The means described for re-converting the devices employed for the raising of weight after the same has fallen, the same consisting of the vertical rod, C, and angular swinging arm or lever, D, turning upon a fulcrum, arranged and operating substantially as herein above described.

Seventhly, I claim the combination of the two part drawing shaft, m′, attached together, as described, with the swinging lever, u, and spring catch, o′, operating substantially as and for the purposes specified.

Eighthly, The arrangement of the two plates or bars, l and m, for holding the metallic bar in proper position while being bent around the mold block, substantially as described.

39,779.—Band Ruffle.—Thomas Robjohn (assignor to E. C. Wooster) New York City:

I claim the new article of manufacture herein described, consisting of a band ruffle composed of a single strip of plaited or gathered muslin, or other material, which is made to produce both the ruffle and the band, by stitching through the parts or gathers with two rows of stitching, one of which is also made to secure the edge of the material which is turned in to give a finish to the band.

39,780.—Harvester.—Henry R. Russell (assignor to himself and Isaac S. Russell), New Market, Md.:

I claim, first, The application to harvesting machines of an outer supporting wheel, B, connected by the frame of the machine by means of hinged plates, d d, and a plate, b′, operating substantially as and for the purposes described.

Second, Attaching the wheel, B, to a vertically slotted and hinged plate, b′, whereby the adjustment of the frame of the machine and the vibrating motion of the axle of wheel, B, is obtained, substantially as described.

39,781.—Machine for Cutting Rasps.—Timothy Smith, of Charlestown, Mass., and A. B. Southwick, of Ballardvale, Mass., assignor to The Whipple File Manufacturing Company, of said Ballardvale:

We claim the worm wheel, M, with its horizontal thread, x, and inclines, i, in combination with the pins, b, or their equivalents upon the rod, c, for the purpose described.

We also claim constructing the worm wheel, M, in segments, as set forth, for the purpose described.

39,782.—Machine for Grinding Half-round Files.—Timothy Smith, of Charlestown, Mass., and James A. Stafford, Boston, Mass., assignor to The Whipple File Manufacturing Company, of Ballardvale, Mass.:

We claim the method herein described of grinding blanks for "half-round" files, by revolving and traversing them in contact with a revolving grindstone, substantially as set forth.

We also claim the method of vibrating the flanks to form the taper, by means of the groove, m, and pins k and l, as described.

We also claim the combination of the carriage, E, the lable, F, and screw, p, arranged and operating as described.

39,783.—Water Wheel.—Thomas Symonds (assignor to himself and Hosea Kendall), Cumberland, Maine:

I claim, first, The buckets, D, constructed in the form herein described, for the purpose set forth.

Second, The combination and arrangement of the buckets, D, gradually enlarging hub, C, and stationary scroll case or apron, E, the whole constructed and operating in the manner and for the purpose specified.

39,784.—Die for forming Bars of Soap.—Thomas Worsley and George W. Dorsey (assignors to said Thomas Worsley), Philadelphia, Pa. Ante-dated April 11, 1862:

We claim the recess, u, formed in the die, B, and communicating with a vessel containing water or other suitable fluid, substantially as and for the purpose herein set forth.

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39,785.—Carriage Coupling.—George P. Kimball (assignor to himself and T. H. Knight). San Francisco, Cal. :

I claim the combination of the axle, D, with the flange, b, pin, A, cap, C, clevis, E, and king bolt, F, when constructed and arranged substantially in the manner and for the purpose herein described.

39,786.—Furnace for Desulphurizing Ores.—Loomis G. Marshall (assignor to himself and Andrew Cochran), of Philadelphia, Pa. :

I claim the arrangement of vertical tubes and slides in a square furnace, in combination with the parallel plates, C, and the triangular-shaped chimney, K, with its regulating damper, J, arranged and combined as herein described.

RE-ISSUES.

1,530.—Water Wheel.—Nathan F. Burnham, York Pa., formerly of Laurel, Md. Patented Feb. 22, 1859 :

I claim, first, A hub, formed with a concave exterior in any manner, substantially as described, so as to derive a lifting tendency from the entrance of the water, and deflect it downward, in the described combination with a bucket formed with face vertical, or nearly so, at the top, to receive the direct force of the water; and inclined at bottom to receive its gravitating force

Second, The combination of the chutes or scrolls, M M, and wheel, Q R, constructed as herein described, to adapt the wheel to operate with good effect with any proportionate quantity of water.

1,531.—Machine for separating or cleaning Ores.—George Asmus, Houghton, Mich., assignee of August W. Schell, Clausthal, Kingdom of Hanover. Patented March 10, 1863 :

I claim, first, The employment or use, for the purpose of separating ores, of an apparatus, substantially such as herein described, whereby the layer of grains of the greatest specific gravity, formed by imparting to the ore a motion in water, is partially insulated from the next succeeding layer of smaller specific gravity, while at the same time the accretion of the first layer is continually drained off.

Second, Insulating either wholly or partially the layer of the heaviest grains from the succeeding layer of specific lighter grains, said layers being formed by the motion of the ore in water, substantially in the manner and for the purpose herein set forth and described.

[The object of this invention is to separate the different substances contained in a certain ore, according to their specific gravity, simply by the motion of the water, and without any attention on the part of the operator.]

1,532.—Steam Engine.—Tisdale Carpenter, Providence, R. I. Patented Jan. 29, 1861 :

I claim, first, Regulating the velocity of a steam engine by connecting a regulator permanently or positively with the induction valves by means of levers of variable length working between a pair of corresponding cam disks, and employed to close as well as open the valve in a positive manner, substantially as herein specified.

Second, The cam, C C', and variable rocking levers, D Z D Z, working between and controlled by said cams, when used in combination with each other and with the induction valves of a steam engine, substantially as herein described, either in connection with a regulator, to constitute an automatically variable cut-off gear, or without a regulator, to serve as an adjustable cut-off.

Third, The arrangement of the eduction valves and their chambers and ports, in the cylinder heads, suostantially as and for the purpose herein specified.

DESIGNS.

1,817.—Carpet Pattern.—Elemer J. Ney (assignor to the Lowell Manufacturing Company), Lowell, Mass.

1,818.—Carpet Pattern.—Elemer J. Ney (assignor to the Lowell Manufacturing Company), Lowell, Mass.

EXTENSION.

Machine for bending the Lips of wrought-iron Railroad Chairs.—George P. Cox, of Malden, Mass., administrator of Samuel A. Cox., deceased, and assignee by mesne assignments of said decedent. Patented Aug. 28, 1849. Re-issued July 14, 1857; again re-issued Aug. 12, 1862 :

I claim, first, A suitable support for a chair blank, in combination with bending levers, or a bending apparatus or a former, or their equivalents, acting in combination substantially as specified hereinbefore.

Second, A drop hammer, or its equivalent, for the purpose set forth, in combination with the bending levers, a former, and a suitable support for the chair blank, or their equivalents, for the purposes set forth, and acting in combination substantially in the manner hereinbefore set forth.

Third, The use of the discharging lever, K, or equivalent therefor, in combination with the former, for the purpose of forcing said former from the chair.

IMPORTANT TO INVENTORS

PATENTS FOR SEVENTEEN YEARS.

MESSRS. MUNN & CO., PROPRIETORS OF THE SCIENTIFIC AMERICAN, continue to solicit patents in the United States and all foreign countries, on the most reasonable terms. They also attend to various other departments of business pertaining to patents, such as Extensions, Appeals before the United States Court, Interferences, Opinions relative to Infringements, &c. The long experience Messrs. MUNN & Co. have had in preparing Specifications and Drawings has rendered them perfectly conversant with the mode of doing business at the United States Patent Office, and with the greater part of the inventions which have been patented. Information concerning the patentability of inventions is freely given, without charge, on sending a model or drawing and description to this office.

THE EXAMINATION OF INVENTIONS.

Persons having conceived an idea which they think may be patentable, are advised to make a sketch or model of their invention, and submit it to us, with a full description, for advice. The points of novelty are carefully examined, and a written reply, corresponding with the facts, is promptly sent free of charge. Address MUNN & CO., No. 37 Park Row, New York.

PRELIMINARY EXAMINATIONS AT THE PATENT OFFICE.

The service we render gratuitously upon examining an invention does not extend to a search at the Patent Office, to see if a like invention has been presented there, but is an opinion based upon what knowledge we may acquire of a similar invention from the records in our Home Office. But for a fee of $5, accompanied with a model of drawing and description, we have a special search made at the United States Patent Office, and a report setting forth the prospects of obtaining a patent, &c., made up and mailed to the inventor, with a pamphlet, giving instructions for further proceedings. These preliminary examinations are made through our Branch Office, corner of F and Seventh streets, Washington, by experienced and competent persons. Many thousands of such examinations have been made through this office. Address MUNN & CO., No. 37 Park Row, New York.

HOW TO MAKE AN APPLICATION FOR A PATENT.

Every applicant for a patent must furnish a model of his invention if susceptible of one; or, if the invention is a chemical productions he must furnish samples of the ingredients of which his composition consists, for the Patent Office. These should be securely packed, the inventor's name marked on them and sent, with the Government fees, by express. The express charge should be pre-paid. Small models from a distance can often be sent cheaper by mail. The safest way to remit money is by draft on New York, payable to the order of MUNN & CO. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents; but, if not convenient to do so, there is but little risk in sending bank-bills by mail, having the letter registered by the postmaster. Address MUNN & CO., No. 37 Park Row, New York.

The revised Patent Laws, enacted by Congress on the 2d of March, 1861, are now in full force, and prove to be of great benefit to all parties who are concerned in new inventions.

The duration of patents granted under the new act is prolonged to SEVENTEEN years, and the Government fee required on filing an application for a patent is *reduced* from $30 to $15. Other changes in the fees are also made as follows :—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Re-issue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design, three and a half years	$10
On filing application for Design, seven years	$15
On filing application for design, fourteen years	$30

The law abolishes discrimination in fees required of foreigners, excepting natives of such countries as discriminate against citizens of the United States—thus allowing Austrian, French, Belgian, English, Russian, Spanish and all other foreigners except the Canadians, to enjoy all the privileges of our patent system (but in cases of designs) on the above terms. Foreigners cannot secure their inventions by filing a caveat; to citizens only is this privilege accorded.

During the last seventeen years, the business of procuring Patents or new inventions in the United States and all foreign countries has been conducted by Messrs. MUNN & CO., in connection with the publication of the SCIENTIFIC AMERICAN; and as an evidence of the confidence reposed in our Agency by inventors throughout the country we would state that we have acted as agents for at least TWENTY THOUSAND inventors! In fact, the publishers of this paper have become identified with the whole brotherhood of inventors and patentees at home and abroad. Thousands of inventors for whom we have taken out patents have addressed to us most flattering testimonials for the services we have rendered them, and the wealth which has inured to the inventors whose patents were secured through this office, and afterwards illustrated in the SCIENTIFIC AMERICAN, would amount to many millions of dollars! We would state that we never had a more efficient corps of Draughtsmen and Specification Writers than those employed at present in our extensive offices, and we are prepared to attend to patent business of all kinds in the quickest time and on the most liberal terms.

REJECTED APPLICATIONS.

We are prepared to undertake the investigation and prosecution of rejected cases on reasonable terms. The close proximity of our Washington Agency to the Patent Office affords us rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Our success in the prosecution of rejected cases has been very great. The principal portion of our charge is generally left dependent upon the final result.

All persons having rejected cases which they desire to have prosecuted, are invited to correspond with us on the subject, giving a brief history of the case, inclosing the official letters, &c.

CAVEATS.

Persons desiring to file a caveat can have the papers prepared in the shortest time by sending a sketch and description of the invention. The Government fee for a caveat, under the new law, is $10. A pamphlet of advice regarding applications for patents and caveats, printed in English and German, is furnished gratis on application by mail. Address MUNN & CO., No. 37 Park Row, New York.

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We are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business we have offices at Nos. 66 Chancery lane, London; 29 Boulevard St. Martin, Paris; and 26 Rue des Eperonniers, Brussels. We think we can safely say that THREE-FOURTHS of all the European Patents secured to American citizens are procured through the Scientific American Patent Agency, No. 37 Park Row, New York.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

Circulars of information concerning the proper course to be pursued in obtaining patents in foreign countries through our Agency, the requirements of different Government Patent Offices, &c., may be had gratis upon application at our principal office, No. 37 Park Row, New York, or any of our branch offices.

ASSIGNMENTS OF PATENTS.

Assignments of patents, and agreements between patentees and manufacturers are carefully prepared and placed upon the records at the Patent Office. Address MUNN & CO., at the Scientific American Patent Agency, No. 37 Park Row, New York.

It would require many columns to detail all the ways in which inventors or patentees may be served at our offices. We cordially invite all who have anything to do with patent property or inventions to call at our extensive offices, No. 37 Park Row, New York, where any questions regarding the rights of patentees will be cheerfully answered.

Communications and remittances by mail, and models by express (prepaid), should be addressed to MUNN & CO., No. 37 Park Row, New York.

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H. B. M., of Pa.—Your best plan to elevate water to your house, for domestic purposes and irrigation, is by a hydraulic ram, placed at the bottom of the hill, some distance below the abundant spring you mention. If you have a well or cistern nearer the house or garden, a small, ornamented windmill may be employed to operate a pump for raising the water.

B. S. W., of Vt.—A powder of orpiment, (red or yellow sulphuret of arsenic) is employed for removing superfluous hair. It is used in a moist condition, and does not injure the skin, like a depilatory powder of quick lime; still we do not advise its application to the human face.

W. M., of Pa.—Plaster-of-Paris is said to produce a superior cement, when mixed with warm instead of cold water. It should, in every case, be applied as soon as it is made, because it sets so rapidly.

G. W. C., of N. Y.—We have seen marble-sawing machines which resemble yours very closely, and we would advise you to have a preliminary examination made, through us, at Washington. This would be the better course to pursue, as a great many applications were made on this class of inventions, some years since, and it is possible that you may have been anticipated.

S and B., of C. W.—We do not think there is any treatise on general foundery work in existence, certainly none to our knowledge. In Overman's Metallurgy, and "Manufacture of Iron" by the same writer, you will find valuable information concerning the treatment and manipulation of that metal; also, in Leslie's "Iron Manufacturer's Guide." The first two books are published by D. Appleton & Co., but can be had in any large city, and the latter is issued by John Wiley, 56 Walker street, New York. We do not know the price of any of them.

J. J. M., of Mich.—Lumber mill-men cannot agree as to the exact velocity of circular saws in cutting pine logs. Old grate bars are used as frequently here, by molders, for castings, as any other kind of scrap pig-iron. They require a high heat and a flux of lime, or oyster shells, in the cupola. A large quantity of slag is generally produced in using such iron. This must all be removed before the molten metal is run into the molds.

J. W., of R. I.—Flour will become sour in course of time, if exposed to a moist atmosphere. This is due to the changeable character of its fibrin. Good boiled starch is the best size which you can use for stiffening thin cotton fabrics. Alkalies tend to prevent size from becoming sour, but they render it yellow, and will not, therefore answer to use for bleached cotton goods.

Money Received

At the Scientific American Office, on account of Patent Office business, from Wednesday, Sept. 2, to Wednesday, Sept. 9, 1863 :—

T. H, & H. J., of N. Y., $44; H. J., of Conn., $25; E. C., of N. Y. $25; J. F. J., of N. Y., $30; W. M., of Mass., $20; R. B. R., of N. Y., $45; T. H. & H. J., of N. Y., $48; I. A. P., of Ill., $20: J. S. F., of Cal. $20; S. C. E., of N. J., $20; W. T., of Ohio, $25; G. G. H., of Conn., $25; W. R., of N. Y., $25; N. H., of Cal., $30; W. H. W., of Wis., $16; C. R., of Pa., $16; C. R., of Vt., $25; R. A. T., of N. Y., $25; J. W. W., of N. Y., $25; F. J., of N. Y., $16; G. M. McG. of Ohio, $20; I. G., of Conn., $20; W. & H., of Cal., $20; C. N. J., of N. Y., $20; A. S., of N. Y., $20; S. D. B., of Pa., $20; R. B., of Mass., $20; S. & H., of Mich., $11; A. G., of Pa., $30; A. B. J. F., of Ind., $15; J. H., of Mass., $25; S. G. W., of Ill., $16; W. B., of England, $16; W. X. S., of Mass., $35; A. McK., of N. Y., $25; S. L. H.; of N. Y., $25; W. S., of N. Y., $16; H. J. Van T., of N. Y., $16; A. M., of Pa., $20; C. N. J., of N. Y., $20, R. W., C., of N. Y., $16; T. F., of N. Y., $20; C. T., McK., of Tenn., $45; W. H. C., of Vt., $30; L. E. R., of Ill., $45: E. H., of N. Y., $16; P. & H., of Ohio, $25; F. C., of Mass., $15; C. H. W., of Mass., $15; G. G. C., of N. Y., $25; P. C., of Pa., $16.

Persons having remitted money to this office will please to examine the above list to see that their initials appear in it, and if they have not received an acknowledgment by mail, and their initials are not to be found in this list, they will please notify us immediately, and inform us the amount, and how it was sent, whether by mail or express.

Specifications and drawings and models belonging to parties with the following initials have been forwarded to the Patent Office from Wednesday, Sept. 2, to Wednesday, Sept. 2, 1863:—

E. C., of N. Y.; S. L. H., of N. Y.; J. W. R., of N. Y.; H. J., of Conn.; A. S. L., of N. Y.; A, McK., of N. Y.; R. A. T., of N. Y.; J. H., of Cal.; T. H. & H. J., of N. Y.; W. & H., of Cal.; C. R., of Vt., W. X. S., of Mass.; J. H., of Mass.; G. S. C., of N. Y.; G. G. H., of Conn.; L. E. R., of Ill.; P. & H., of Ohio; W. T., of Ohio; H. W. C of Vt.

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THE SIXTEENTH ANNUAL EXHIBITION OF THE Maryland Institute, for the Promotion of the Mechanic Arts, will be opened in the Institute's Spacious Hall, Baltimore, on the 5th day of October, and continue to the 23d day of November. The mechanics, manufacturers, artists and business men of the country are cordially invited to contribute to this exhibition Circulars containing regulations and arrangements will be furnished promptly by application to JOHN S. SOLLY, Actuary of the Institute. W. W. MAUGHLIN, Chairman of Committee. 12 3

WANTED—TO CORRESPOND WITH PARTIES owning rights for machines to bend and punch horse-shoes. Address ROBERT HALE, Fitchburg, Mass. 1*

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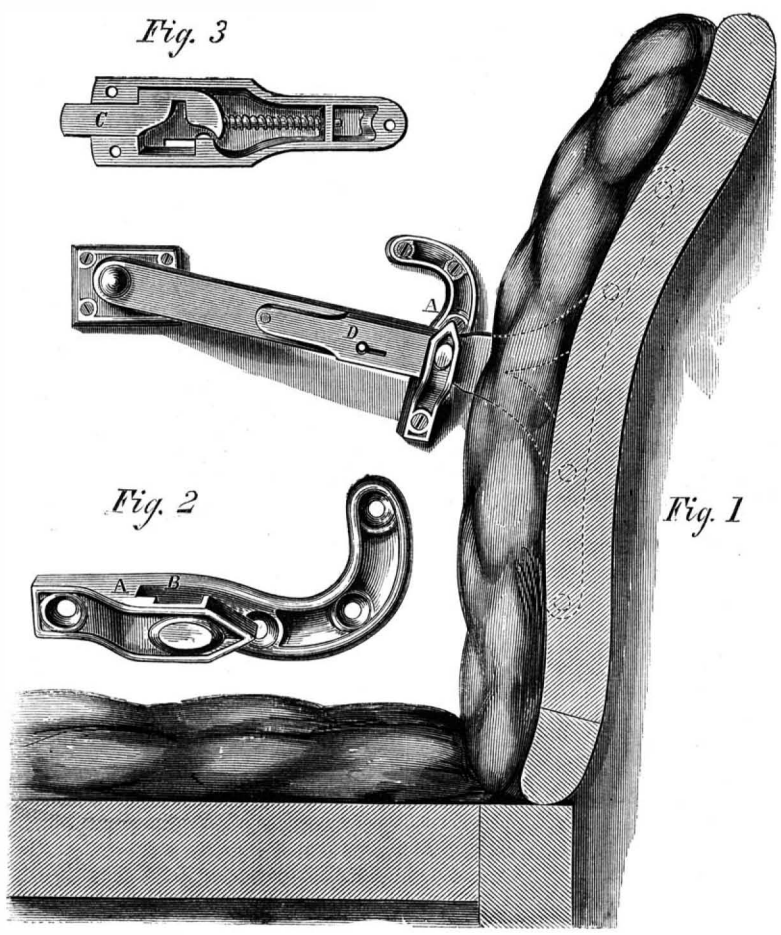
Improved Car-seat Lock.

Many persons traveling by rail have felt the annoyance and discomfort resulting from an unceremonious usurpation of their seats by other travelers. Sometimes an old lady, with a band-box and three bundles, turns over the back of the seat some individual has temporarily left, and converts it into a receptacle for her luggage. This practice is now most effectually checked by the recently invented car-seat lock, which is herewith illustrated. The construction of this device is extremely simple and efficient, and a brief explanation and inspection will enable all persons to comprehend its merits at a glance. The seat itself, and all the fixtures, are constructed in the usual manner : but the bracket A (see Fig. 2), has a recess, B, cast in one of its edges, into



MORE'S PATENT CAR-SEAT LOCK.

which the bolt, C (Fig. 3) is shot by a key inserted in the key-hole. The lock itself, D, is shown in detail in Fig. 3, having the outer plate removed; where the end of the key is also seen. The lock is strongly fastened to the arm on which the seat back works, and the lock cannot be opened or the back of the seat thrown over, unless the key is furnished by the conductor, or other authorized person. These locks are in use on the Cincinnati, Hamilton and Dayton Railroad, where they are much esteemed. The patentee is prepared to furnish them in any quantity to suit purchasers. Patented July 21st, 1863, by R. B. More, Master of Car Repairs, C.H. & D. R.R., Cincinnati, Ohio; for further information address him at that place, care of said railroad company.

New Use for Apple Juice.

It appears from the following statement, which we find in several of the English journals, that the people of that country are threatened with a cider famine; not from the failure of the apples, although a partial crop, but because they are likely to be applied to a more profitable purpose, so far as the growers are concerned, than in making a household beverage.

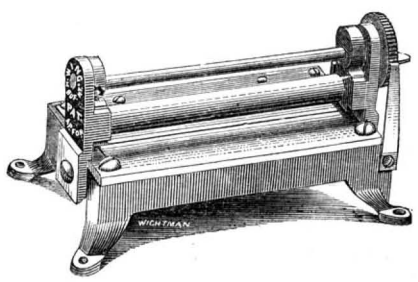
It seems that the Manchester calico dyers and printers have discovered that apple juices supply a desideratum long wanted in making fast colors for their printed cottons, and numbers of them have been into Devonshire and the lower parts of Somersetshire, buying up all the apples they can get, and giving such a price for them as in the dearest years hitherto known has not been offered. We know of one farmer in Devonshire who has a large orchard, for the produce of which he never before received more than £250, and yet he has sold it this year to a Manchester man for £360. There can be no doubt that the discovery will create a revolution in the apple trade; and we may add that it will give an impetus to the cultivation of this hardy fruit.

Strange things happen in these days, and in a few years the manufacturers of England may be as anxious to obtain American apples as they are now to get our cotton.—*Exchange.*

[We have seen the above copied extensively. No two colors are produced by the same substances, and there is no single substance like the malic acid in apple juice, capable of rendering all colors fast on calicoes or any other fabrics. Acetic acid or vinegar, is only obtained from apple juice or cider by fermentation. It is an acid much used in calico printing, chiefly for making the acetates of lead and iron, but it is obtained for such uses, by the distillation of wood, at much less cost than from fermented cider; and this is the chief source from whence it is derived, under the names of pyroligneous acid and wood spirits. Large quantities of it are manufactured from wood in several parts of the United States. Wood vinegar is generally sold in a more concentrated condition than wine or cider vinegar; and when properly filtered, it is as transparent as pure water.

WING'S PATENT LEATHER-SPLITTING MACHINE.

For some purposes of trade and commerce it becomes necessary to reduce the thickness of sides of leather. Machines have been invented for this purpose, operating on different principles. The accompanying engraving is an illustration of an improved apparatus of this class, for which a patent was granted, through the Scientific American Patent Agency, to Horace Wing, of Buffalo N. Y., on Aug. 25. 1863.



This invention consists, first, in the employment for adjusting the gage roller at the proper distance from the plane of the edge of the splitting knife, according to the thickness to which the skin is to be reduced, of a pair of eccentric cams attached to the same shaft, arranged to act one upon each of the journal boxes of the said roller, whereby the uniform adjustment of both ends of the said roller is insured, and the difficulty of adjusting the said roller correctly by separate adjustments—such as the screws commonly employed at each end—is overcome. It also consists in making the standards or housings which contain the journal boxes of the gage roller adjustable, to bring the said roller more or less over the edge of the splitting knife, whereby, by obviating the necessity of adjusting it, the knife is enabled to be better secured against springing or accidental displacement.

Further information respecting this machine can be had by addressing Horace Wing, Buffalo, N. Y.

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To the Inventor!

The SCIENTIFIC AMERICAN is indispensable to every inventor, as it not only contains illustrated descriptions of nearly all the best inventions as they come, but each number contains an Official List of the Claims of all the Patents issued from the United States Patent Office during the week previous; thus giving a correct history of the progress of inventions in this country. We are also receiving, every week, the best scientific journals of Great Britain, France and Germany; thus placing in our possession all that is transpiring in mechanical science and art in those old countries. From those journals we shall continue to transfer to our columns copious extracts of whatever we may deem of interest to our readers.

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